User manual

MCC201 / MCC201H
H.264 Encoder/decoder

This manual provides information on installation setup and operation of the video server, as well as troubleshooting tips.

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1. Introduction

About this manual

This User Manual provides information on installation setup and operation of the MCC201 and MCC201H, as well as troubleshooting tips.

Features

MCC201 is a video and audio transmission system that provides broadcast quality audio and video, based on IP networking. MCC201 can operate either as an Encoder or as a Decoder, the desired mode is user-selectable. ***MCC201H*** is a model variant which has all other functions available except HD-SDI operation.

Video

- Highly efficient compression algorithm, H.264 (Baseline and High profiles) & MJPEG support
- Wide range of transmission rates: Primary stream 32 kbps...10 Mbps, secondary stream max. 1 Mbps
- Various transmission modes: CBR, VBR
- Motion detection
- Support for analogue baseband video, HDMI video and HD-SDI video
  (***Note!*** *HD-SDI video not available on MCC201H*)

Audio

- Multi-Transmission Mode : Unidirectional Mode (IP-server to Client PC or Decoder / Client PC or Decoder to IP-server), Bi-directional Mode

Network

- Fixed IP & Dynamic IP (DHCP) support
- 1:1, 1:N support
- Multicasting
- Automatic transmit rate control according to network conditions
- OnVIF, PSIA compliant

Serial Data

- RS-232 support
- RS-422 (4-w) or RS-485 (2-w) support
- Data pass-through mode : Serial data communication between Encoder - Decoder

Sensor and Alarm

- Support direct connections of external sensor and alarm devices
- Event Alarm

USB

- Connection to internal or external USB storage for remote access, recording and playback

User Interface

- System configuration by web browser (Internet Explorer recommended)

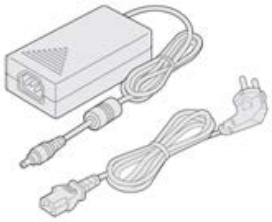
High Reliability

- Reliable embedded system
- System recovery by watchdog functions

Product and Accessories

MCC201/MCC201H

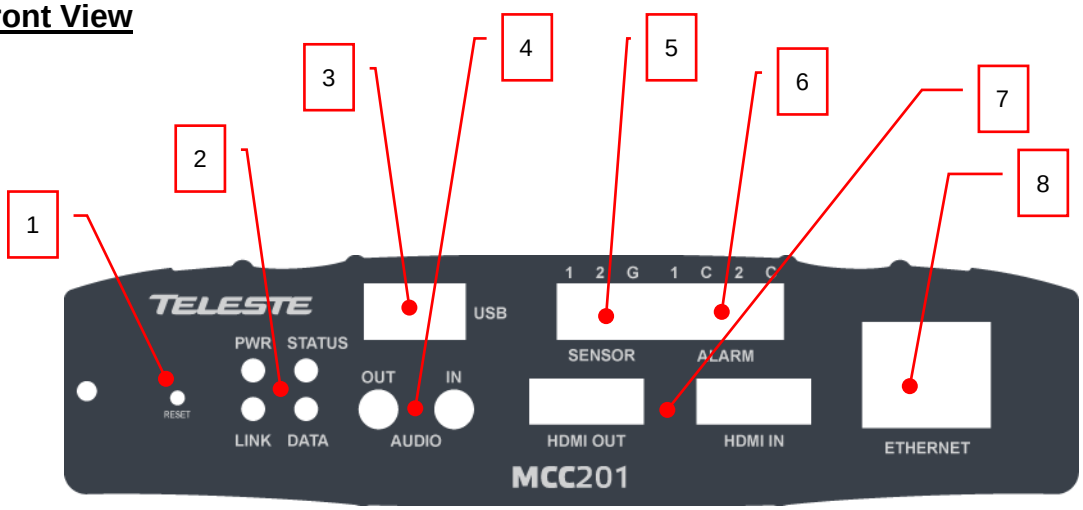
User Manual (in CD)



Power adapter and Cable

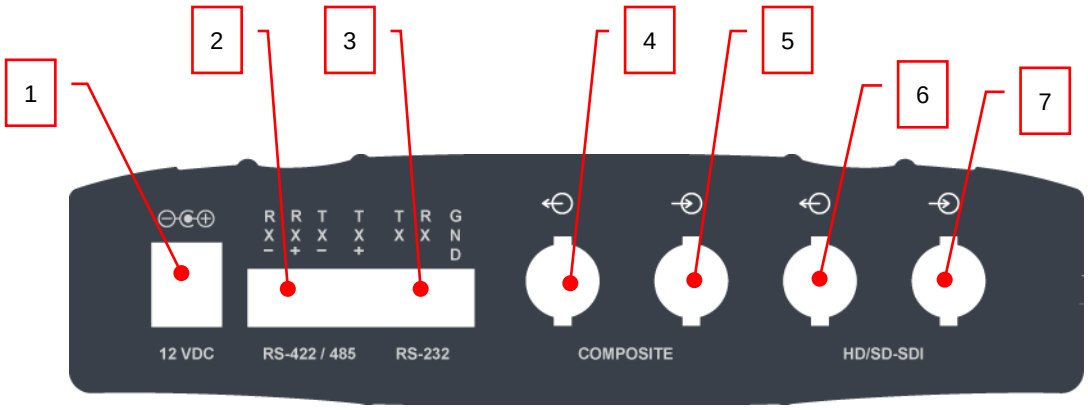
Part Names and Functions

Front View



Position	Description	Function
1	Reset button	Initialization of network setting
2	LEDs	Display power On/Off condition, Link, Status and data
3	USB	USB (2.0) port for any USB device
4	Audio In, Out	Audio Input and Output
5	Sensor	Sensor Input
6	Alarm	Alarm or Relay Output
7	HDMI In, Out	HDMI Video Input and Output
8	LAN (Ethernet)	10/100Base-TX electrical Ethernet interface

Rear View



Position	Description	Function
1	POWER In	DC +12V power input
2	RS-422/485	Serial port for PTZ control and etc.
3	RS-232	Serial port for PTZ control and etc.
4	Composite Out	Composite Video Output
5	Composite In	Composite Video Input
6	HD/SD-SDI Out	HD/SD-SDI Video Output *(MCC201H, not in use)*
7	HD/SD-SDI In	HD/SD-SDI Video Input *(MCC201H, not in use)*

System Connections

MCC201 operates as one of two modes; as Encoder or Decoder. MCC201 systems can be connected in either 1-to-1 fashion where one encoder is connected one decoder or 1-to-many fashion where one encoder connected to many decoders.

Following chart shows data status of video, audio and serial data on each mode.

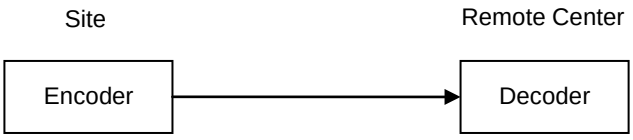
System Mode	Video	Audio	Serial Data
Encoder	Transmit	Transmit/Receive	Transmit/Receive
Decoder	Receive	Transmit/Receive	Transmit/Receive

Therefore, the system modes are defined by the video communication and all system modes are capable of bi-directional transmission of audio or serial data.

Topology

Generally, the encoder and a decoder are connected in 1-to-1 mode. To support specific situation, 1-to-multiple connection is also supported.

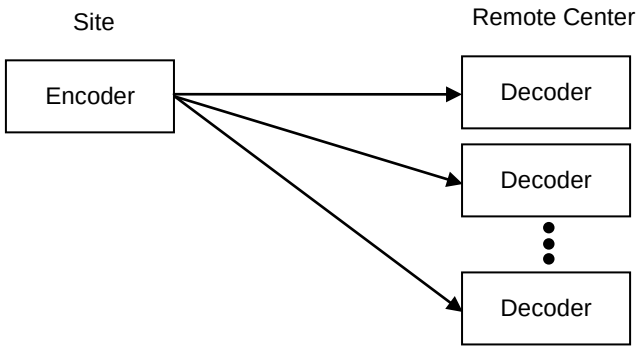
- **1:1 Connection (Unidirectional Transmission)**.



The most commonly used configuration is 1 to 1 connection. An encoder is installed at a site where video images can be transmitted and a decoder is installed at a center location to receive and view the video images on monitors. Audio and serial data are transferred in either direction.

A decoder and encoder can be connected by setting the encoder's address at the decoder's remote IP.

- **1:N Connection (Unidirectional Transmission)**.



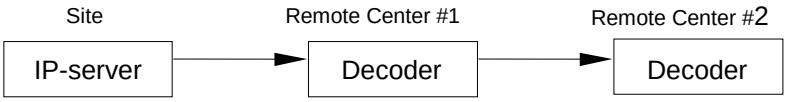
In this configuration, a site can be monitored from many remote center locations. Maximum connections would be limited by the network bandwidth.

Functionally, the VMS (Video Management System) software can replace the decoder.

Multicast Mode

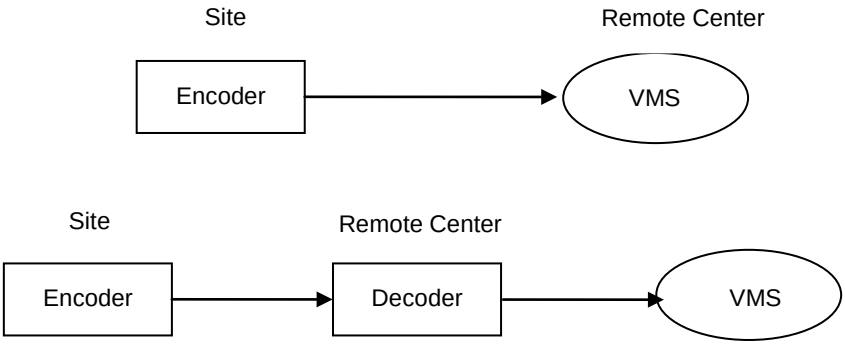
In the network supporting multicast mode, if **Multicast** is setup as a system protocol, you can use bandwidth efficiently regardless of the number of decoders. In 1:N connection, a large number of decoders can receive audio and video data from an encoder by using a single streaming transmission.

- **Relaying**



In this arrangement, video and audio can be retransmitted from a center to another center. The arrangement is useful when the network bandwidth at the site is limited while there is more than one center wanting to monitor the site.

- **VMS (Video Management System)**



VMS (Video Management System) is a Windows based remote monitoring program to access multiple encoders for real-time monitoring or control of the encoders and connected cameras. A typical integration to VMS system is done via OnVIF interface.

2. Installation

Connecting Video

- **Connecting with Megapixel Camera**

  Connect a camera which supports HDMI or HD-SDI output to the HDMI or HD-SDI Input port of video encoder accordingly. *(**Note!** HD-SDI not available on MCC201H)*

- **Connecting with Analogue Camera**

  Connect a camera to the encoder BNC video Input port.

- **Decoder System**

  Connect a monitor to HDMI or COMPOSITE (BNC) output of the decoder.

Connecting Audio

Audio is full-duplex. It is possible to set the mode as Tx-only, Rx-only or Tx-Rx.

- Connect audio input and output ports to audio devices accordingly.
- The Audio signal required is line level, so audio equipment with an amp, mixer or other amplifier should be used.

Connecting Serial Ports

For camera control, PTZ controller (keyboard) and receiver can be connected to serial ports. Two corresponding serial ports in encoder and decoder which are connected in connected in 1-to-1 fashion works in pass-through mode. This means that commands at a local system's COM1 port will be transparently passed to the remote system's COM1 port. Also, a command at a local system COM2 port will pass to the remote system's COM2 port.

Connecting Sensor and Alarm

Connect sensor and alarm devices to corresponding terminals accordingly.

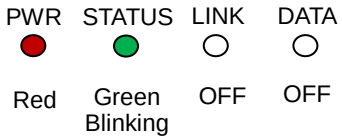
Connecting Power

After confirming the power source, connect power adaptor and connect the 12VDC connector to the system.

Check the system start-up

Once the power is supplied to the camera, it will start booting. The system will boot up to an operating mode after approximately 40 - 60 seconds. The green LED on the Ethernet port will flash indicating the system is ready.

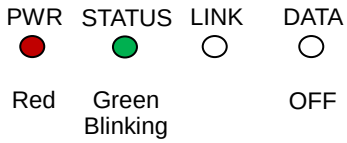
- **Encoder LED Display**



These LEDs show that the camera is connected but a decoder is not connected.

Once the encoder is connected to a decoder, color of “LINK” LED will turn into green color and “ DATA” LED will blink as video or audio transmissions occur.

- **Decoder LED Display**



These LEDs show that the Decoder has started without connecting to an encoder. Once an encoder is connected, the color of “LINK” LED will be turned to green and the “DATA” LED will blink as video or audio data transmissions occur.

- **Description of LEDs**

System status can be monitored with LED display

LED	State	Description
PWR	Off	Power off
	Red	Power on
STATUS	Green blinking	Normally operating
	Red	System failure: Needs diagnostics
	Constant change of colors between Red and Green	NTSC/PAL setting does not match with input video signal
	Red blinking	Failed to obtain IP address in DHCP mode
	Constant change of colors between Green blinking 2 times and Red blinking once	Failed to register on DDNS server
	Green blinking, Red blinks once every 5 seconds	Video loss in Encoder system
	Constant change of colors: Green, Orange, Red color in turn	Formatting USB storage device
LINK	Off	No connection to remote system
	Green	Connected to a remote system
	Red blinking	Decoder only: trying to connect to an Encoder
	Orange	Illegal connection (unsupported combination of system modes)
DATA	Green	Data transmission in progress
	Red	Data loss
	Off	No data transmission

3. System Operation

Remote Video Monitoring

There are two ways to monitor video when the center system and MCC201 are connected. In order for a proper operation, an IP address must be set accordingly.

Default IP Address : http://192.168.10.100

Default ID : admin	**Default Password : 1234**

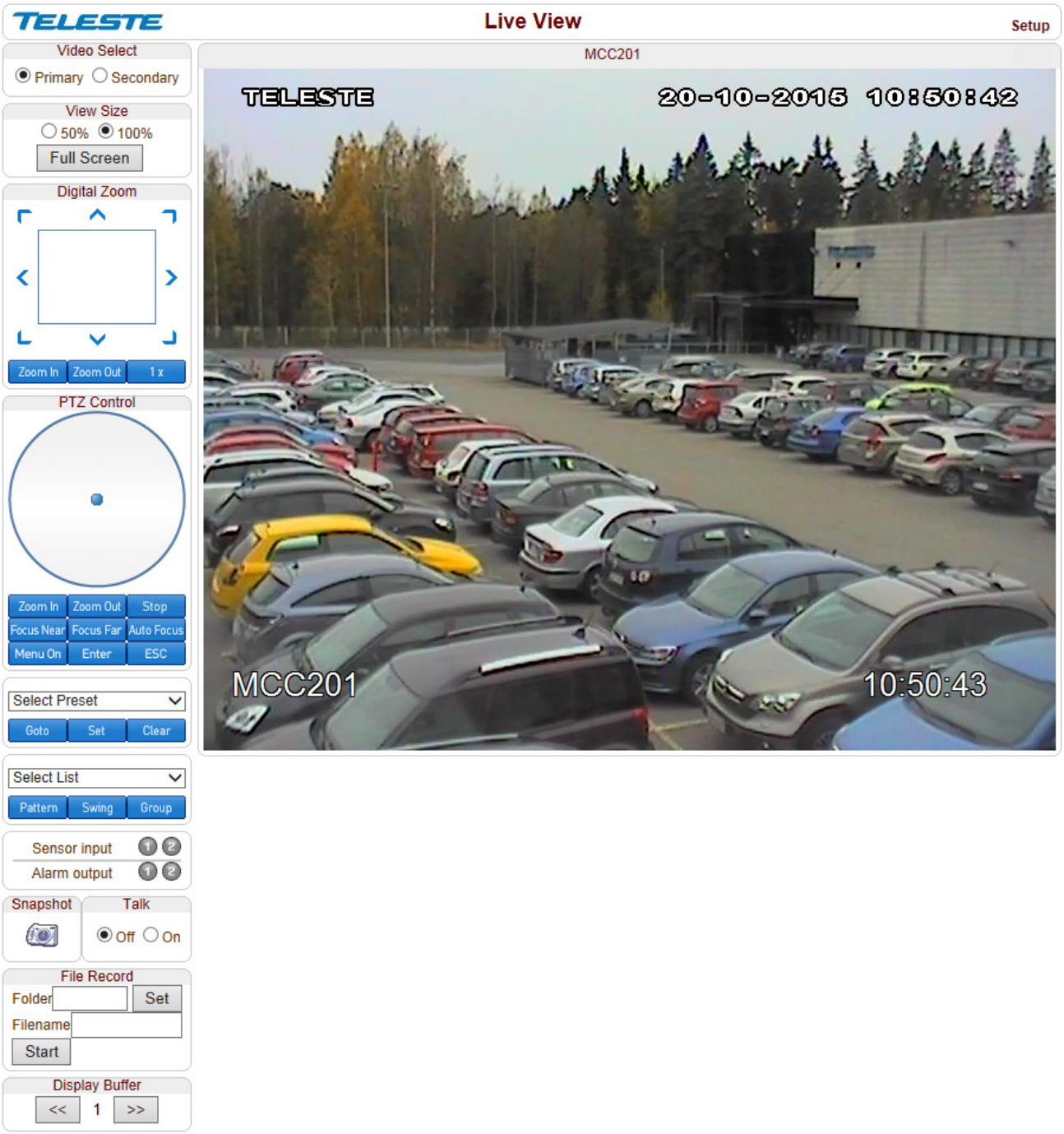
Video Monitoring with Decoder System

Once the encoder IP address is set in the remote IP address section of the decoder, the decoder system will connect to the encoder system and start receiving the video images. Normally, a monitor connected to the decoder will display video images.

Video Monitoring using Internet Explorer

When the MMC201 or MCC201H is managed by a Windows Explorer browser, shortly after logging the OS will ask permission to install an Active-X component (publisher is Teleste Corporation) to the user´s computer. This plug-in component is needed in order to activate the Live View software video decoder as shown below. Should you not accept the activation the video is not available within the browser. However, the further configuration of the device is not prohibited and all other device settings are available in a normal fashion.

Live View controls



- **Video Select**

  Select the Video stream to be viewed: **Primary** or **Secondary**

  This camera is capable of dual streaming; primary streaming and secondary streaming.

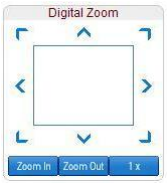
  Video will be displayed according to the resolution set on video configuration. If dual streaming (**"Use Dual Encode" Menu in Video page**) is not activated, secondary video is not available.

- **View Size**

  Adjust the Screen size

  Screen size is initially adjusted according to the compression resolution. If you click 50% icon, the whole screen size will be reduced to half size.

- **Digital Zoom**

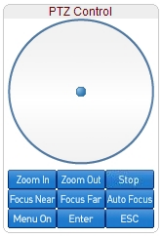


  Control the Digital zoom on the screen

  The more the camera zooms in, the smaller the square of control panel is. Position of the image can be changed by moving position of the square.

  If you press **x1,** the screen will return to the normal size.

- **PTZ Control (Optical Zoom & Digital zoom built-in the camera)**



  Control PTZ and PTZ Control Panel is used for controlling external PTZ devices when the external PTZ devices are connected through serial port.

  It is possible to make zooming control by **Zoom in/out** buttons of PTZ control Panel (In order to use digital zoom, select **Digital zoom ON** in the **Camera** tab)

- **Stop**

  Stop on-going PTZ action.

- **Focus Near, Focus Far, Auto Focus**

  Adjust the focus of the lens.

- **Select Preset**

  Set preset position and move to the specific preset position.

- **Goto**: Move to the selected preset entry if the preset entry is set.
- **Set**: Set the current position to the selected preset entry.
- **Clear**: Delete the selected preset entry.

- **Sensor Input**

  Display the status of the sensor in real time.

  This camera supports one sensor input. When the sensor of the camera is working, the sensor light turns red.

- **Alarm Output**

  Operate the alarm device by pressing the number icon.

  This camera supports one alarm output. A number icon indicates status of the alarm device.

- **Snapshot**

  Capture video images and store them as BMP or JPEG files.

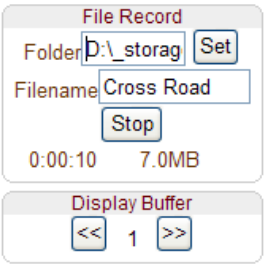
- **Talk**

  Transfer audio from PC's mic to the camera.

- **File Record**

  Recording to an AVI file on Live View page is available. AVI files are generated in the specified folder or in specified file name on the PC where web browser is running.

1. Press "**Set**" button to select folder or create a new folder. Enter the file name on Filename field.
2. Press **"Start"** button to start to record.
3. Press **"Stop"** button to stop to record.
4. AVI file named "**IP address_hh_mm_ss"** or "**File name_IP address_hh_mm_ss"** will be generated in the specified folder depending on whether the path specified a folder or a prefix of the file name.



- **Display Buffer**

  Set the number of video frames to be buffered before being displayed on web browser. Larger value results in smoother video by sacrificing the latency. A setting of 10 ~ 15 frames can be used generally for most situations.

Initialization of IP address

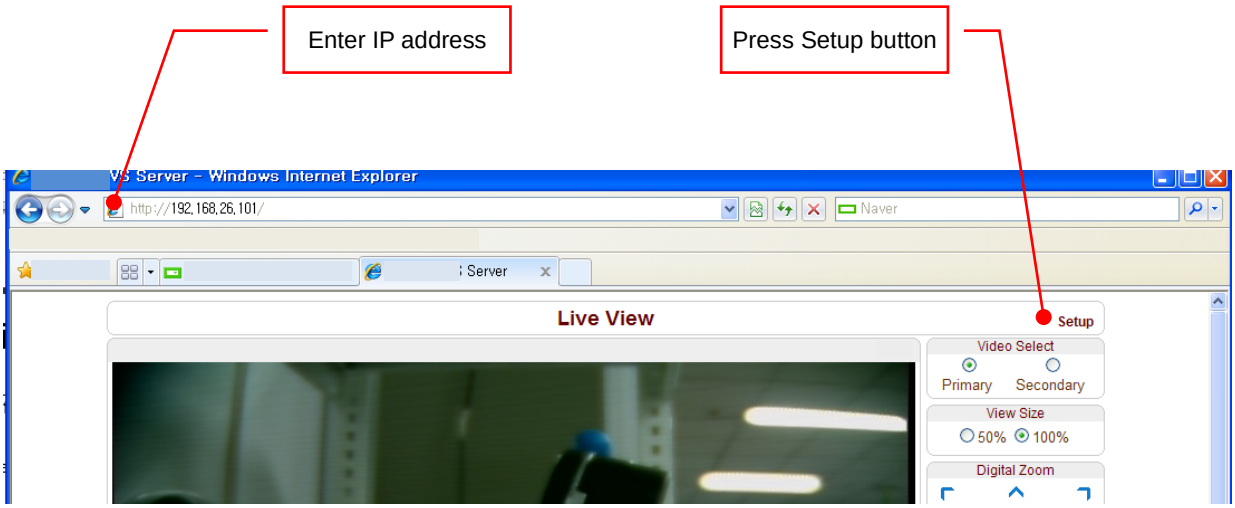
If needed the IP address of the device can be restored to factory default values by using the reset button on the rear side of the MCC device.

1. While system is in operation, press the reset button for more than 5 seconds.
2. The device shall reboot (see the led indicators).
3. Once the device has completed the reboot and has restarted, the default IP address settings are as follows:

• IP mode	**Fixed IP**	**• IP address**	**192.168.10.100**
• Subnet mask	**255.255.255.0**	**• Gateway**	**192.168.10.1**
• Base port	**2222**	**• HTTP port**	**80**

4. Remote Configuration

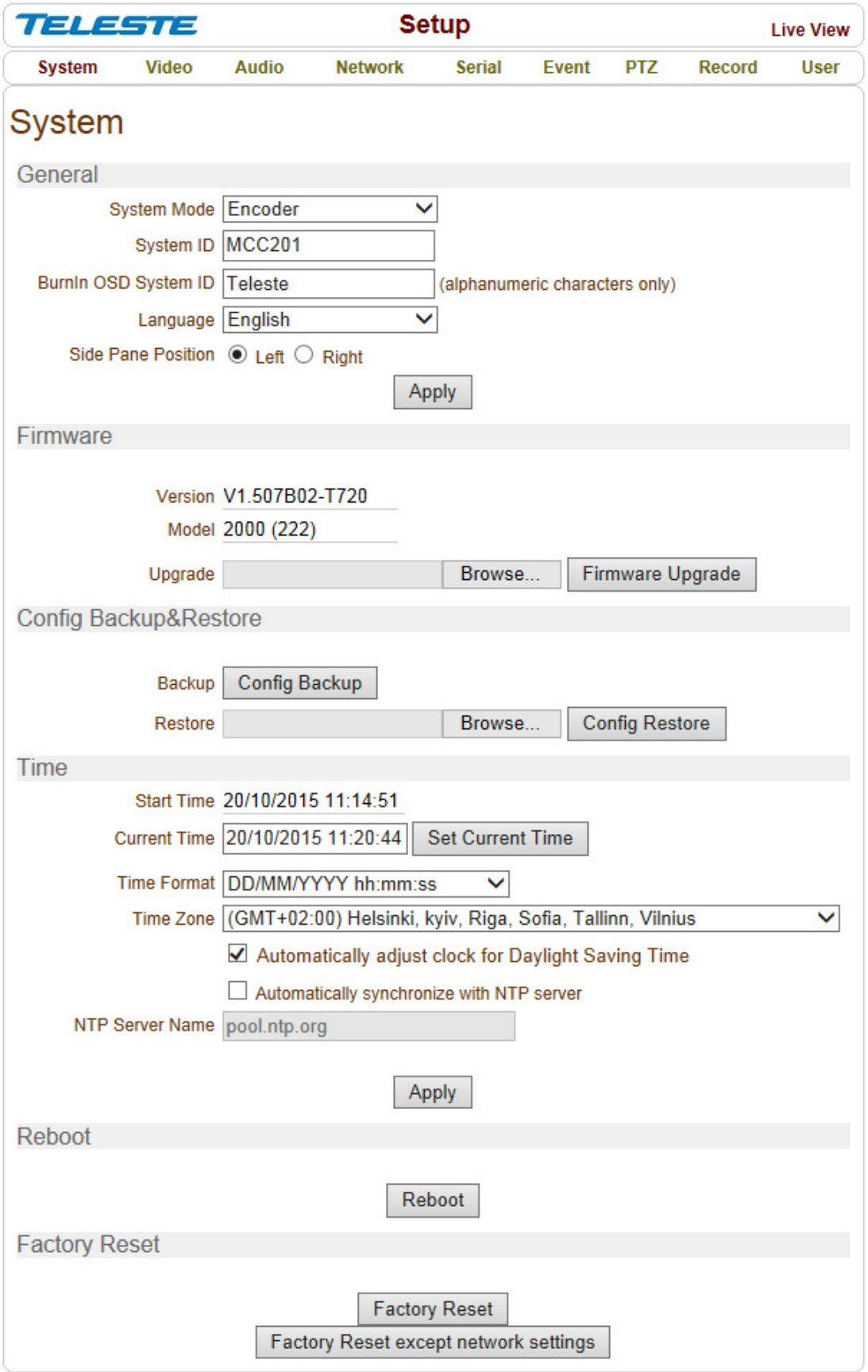
Remote setting is available by using web browser. Enter IP address of camera and then a live view screen appears as below. Press **Setup** button located in the upper right area of the monitoring screen to go to the server setup. For Remote Setting, user should be authorized higher than manager level.



The remote configuration window may be slightly different depends on the system modes (Encoder, Decoder). The general explanation of the configuration in this manual is based on Encoder system and differences according to the modes will be clarified when needed.

The configurations are grouped into 10 categories: **System**, **Video**, **Audio**, **Network**, **Serial**, **Event, PTZ, Record, User and Camera.** Any configuration changes are not applied until **Apply** button is pressed. Leaving the page without pressing **Apply** button, any changes in the page will be discarded.

System Configuration



General

- **System ID**

  Enter System ID that is used as a camera title.

  The set System ID is displayed with video image on Web browser.

  The System ID is also transferred to remote software, such as VMS, and displayed on it.

- **Burnin OSD System ID**

  The text string added in here shall be inserted on top of video before encoding and it is permanently included with video stream.
  Only alphanumeric and blank characters are allowed. Position and size can be configured on **Burnin OSD section** of Video page.

- **Language**

  Select the language to be used for web-based configuration.

Firmware

- **Firmware version**

  Displays the current firmware version.

- **Board ID**

  Displays the network board ID of the video server.

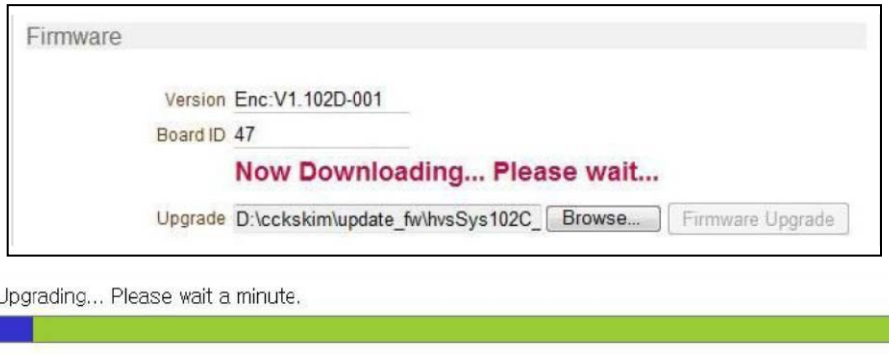
- **Upgrade**

  For the firmware upgrade.

  1. Press **Browse** button to select a firmware file from the computer or network drive.
  2. Press **Firmware Upgrade** button to start to upgrade.
  3. Messages for showing status (downloading / upgrading) will be displayed.
  4. The video server will reboot automatically after completing upgrade.

  Note! Do not switch the power off during the firmware upgrade.

  Be patient - the process may take several minutes.



Config Backup and Restore

- **Backup**

  All the device settings can be stored into a backup file for a later use
  (such as recovery or setting a spare part unit).

- **Restore**

  Stored configuration can be browsed and restored. The server is rebooted once **Config Restore** button is pressed.

Time

- **Start Time**

  Displays the date and time for the last system startup.

- **Current Time**

  Current date and time.
  Enter a new date and time and press **Set Current Time** button to update date and time.

- **Time Format**

  Change the time format. Selectable time formats are as below.

- YYYY/MM/DD hh:mm:ss (Ex. 2010-4-11 18:18:42)
- DD/MM/YYYY hh:mm:ss (Ex.11-4-2010 18:18:42)
- MM/DD/YYYY hh:mm:ss (Ex. 4-11-2010 18:18:42)

- **Time Zone**

  Select the desired time zone for the system.
  Depending on the time zone, Daylight Saving Time will work automatically.

> A **time zone** is a region of the earth that has uniform standard time, usually referred to as the **local time**. By convention, time zones compute their local time as an offset from UTC (Coordinated Universal Time). In casual use, GMT (Greenwich Mean Time) can be considered equivalent to UTC. Local time is UTC plus the current time zone offset for the considered location.

- **Automatically synchronize with NTP server**

  Synchronize the camera time with an NTP server using NTP (network time protocol).

  Name of the NTP server should be registered on NTP server Name.

> The **Network Time Protocol** (**NTP**) is a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. It is designed particularly to resist the effects of variable latency by using a jitter buffer.

Reboot

- To reboot the video server operation.

  Do not press the Reboot button unless the server needs a reboot.

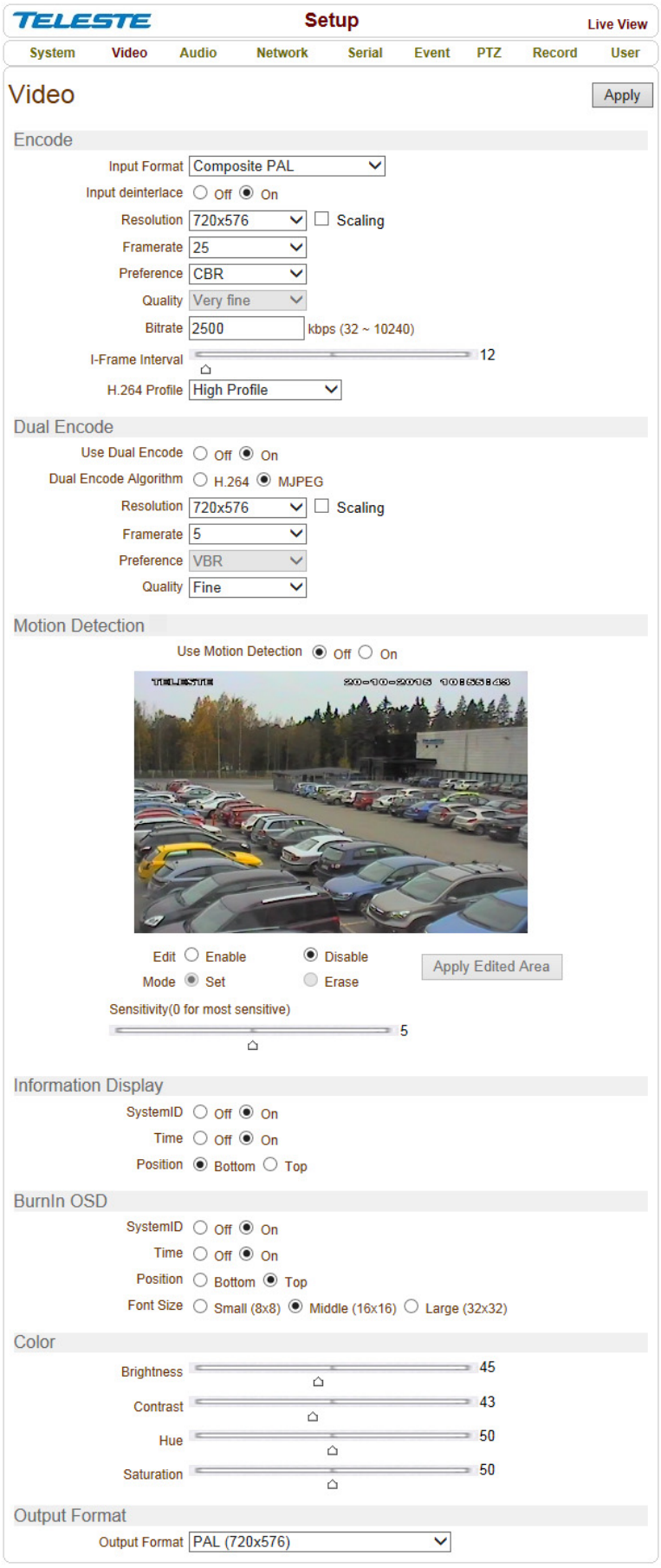
Factory Reset

- All settings including user accounts and logs are cleared.

Factory Reset except network settings

- All the settings except for current network settings are changed to default values.

Video Configuration



Encode

Note! *Some of the features are not available until the unit is connected to video signal.*

- **Input Format**

  Select the desired video input format according to the video source. When in encoder mode the MCC201 supports analogue composite video (PAL & NTSC) but also digital HDMI and HD-SDI signals. For the digital signals the dropdown menu is containing a selection of supported video resolutions.

  Note! *MCC201H supports only HDMI and analogue video formats.*

- **Input Deinterlace**

  When operating with interlaced analogue video the deinterlacing function can set either **ON** or **OFF**.

- **Resolution**

  Select video encoding resolution.

  Scaling option is used when encoding resolution is different from input resolution. Without **scaling** option the input video is cropped according to defined encoding resolution. If scaling is enabled the input video is adjusted to match the encoding resolution.

- **Framerate**

  Determine the maximum number of frames per second for the video stream.

  1, 2, 3, 4, 5, 6, 8, 10, 15, 20, 25 and 30 (60) frame rate can be selected.

- **Preference**

  Available video bit rate controls are **CBR** (for constant bit rate) and **VBR** (for variable bit rate).

  CBR mode presents a fixed bit rate defined for the video stream in the network. The user must define a fixed value on the bitrate field.

  VBR mode presents a variable bit rate and corresponds the changes on the video content.
  When VBR mode is selected the user have to define the desired video quality level (not bitrate).

- **Quality**

  Select the video quality level for the VBR mode. Available levels are Ultra fine, Very fine, Fine, Normal, Below normal, Economy, Poor and Very poor.

  Quality mode (VBR encoding) tries to encode every frame in a constant quality. Therefore, resulting bitrate may vary a lot depending on the complexity or activity changes in the input video. It is preferred when constant video quality is required and network bandwidth is enough for delivering the stream of highly varying bitrate.

- **Bit rate**

  Determine bitrate value between 32 ~ 10240 kbps.

  Bitrate mode (CBR encoding) allows you to set a fixed target bitrate that consumes a predictable amount of bandwidth. In order to maintain the bitrate limit, the video is dynamically controlled regardless the complexity or content changes on the incoming video.

- **I-Frame Interval**

  The I-frame interval can be selected between values 1 to 255. For example a value of 1 is meaning that every sent frame is I-frame whereas a value of 25 is meaning that every 25th frame is an I-frame.

- **H.264 Profile**

  Select H.264 Profile: **High Profile** or **Baseline Profile**.

  The standard defines various sets of capabilities, which are referred to as profiles, targeting specific classes of applications.

- **High Profile (HiP)**

  The primary profile for broadcast and disc storage applications, particularly for high-definition television applications (for example, this is the profile adopted by the Blu-ray Disc storage format and the DVB HDTV broadcast service).

- **Baseline Profile (BP)**

  Primarily for low-cost applications that require additional data loss robustness, this profile is used in some videoconferencing and mobile applications. This profile includes all features that are supported in the Constrained Baseline Profile, plus three additional features that can be used for loss robustness (or for other purposes such as low-delay multi-point video stream compositing).

Dual Encode

- **Use Dual Encode**

  Select **ON** to enable the dual encoding with a secondary video stream.

  The secondary video can be viewed on **Live View** window by selecting **Secondary** on **Video selection**.

- **Dual Encode Algorithm**

  Select **H.264** or **MJPEG** for the secondary streaming.

  Both CBR and VBR modes are available. However the MJPEG is supported only by the VBR mode and hence the video quality level needs to be assigned.

Motion Detection

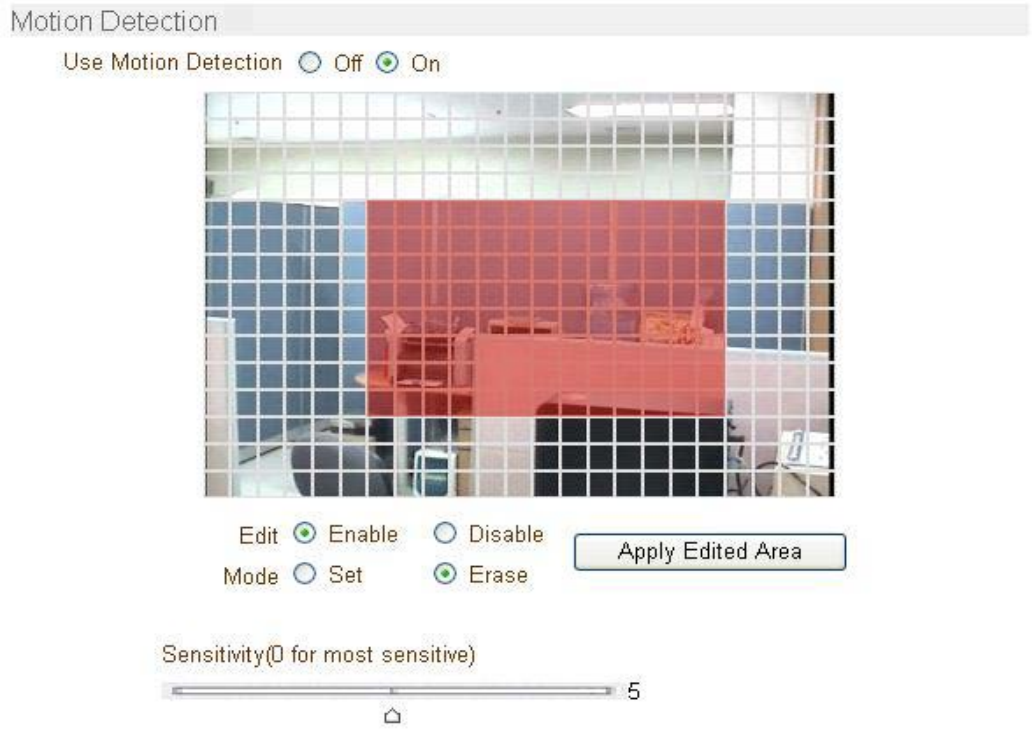
- **Use Motion Detection**

  Determine to use **Motion Detection** function.

- **Motion Detection Area Editing**

  Configure regions for motion detection. Regions of arbitrary shape can be configured by the following steps.

  1. Select **Enable** on **Edit** tab.
  2. Select editing Mode. **Set** is for including cells to motion detection region and **Erase** is for excluding.
  3. Select cells using the right button of the mouse. Multiple cells can be selected conveniently by press and dragging.
  4. Press **Apply Edited Area** to save the editing.



- **Sensitivity**

  Sensitivity is the condition to trigger an event of motion detection.

  The value determines the sensitivity of the motion detection within a block: the smaller, the more sensitive. It is selectable from 0 to 10.

Information Display

System ID and/or server time can be display over the video window in Internet Explorer. Each item can be turn on or off separately, and position also can be configured. This information is displayed **after the video is decompressed.**

BurnIn OSD

Insert text for System ID and enable timestamp (date & time) for the streamed video. The information is added on top of video before encoding. System ID and time respectively can be turned on or off in the video. Position and Font size can be configured also. System ID for BurnIn OSD exists independently from normal System ID.

Note! *That size of Burnin OSD display varies according to the encoding resolution setting. This is inevitable because Burnin OSD is inserted to the frames before encoding is performed. The following table describes the rule for BurnIn OSD display.*

Resolution	Small (8x8)	Middle (16x16)	Large (32x32)
352x480 / 352x240 / 352x576 / 352x288	2	1	0
720x480 / 720x240 / 720x576 / 720x288 / 640x480 / 800x600	2	2	1
1024 x 768 / 1280x720 / 1280 x 960 / 1280x1024 / 1440x900 / 1600x900 / 1680x1050 / 1920x1056 / 1920x1080 / 2048x1536 / 2560x1600 / 2592x1936	2	2	2

2 : Both System ID and Time are displayed.

1 : Either System ID or Time can be displayed. When both are enabled, System ID is displayed.

0 : No items are displayed. This is because video area is too small to display OSD text in large text.

Output Format

When in encoder mode the input video signal is available **for local monitoring and previewing** either on the composite video output (BNC out) or on the digital output (HDMI out).

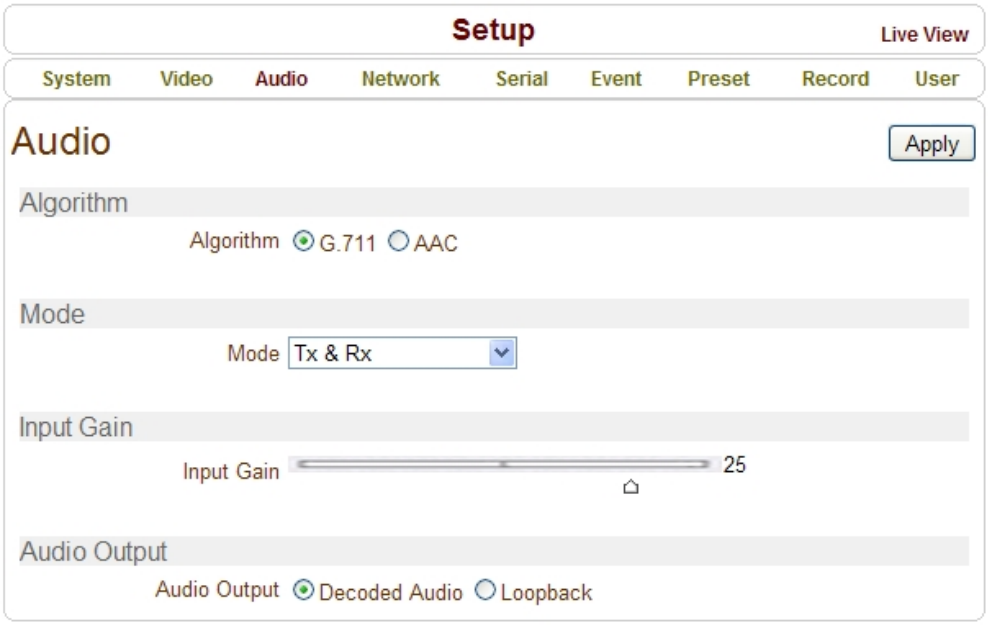
Note! *The preview video is captured before entering the encoding engine of the device.*

Select the output format for the monitor preview according to the video output and monitor specification.

The available preview modes are:

- NTSC (720 x 480)
- PAL (720 x 576)
- 720p60 (1280 x 720)
- 1080i60 (1920 x 1080)
- 720p50 (1280 x 720)
- 1080i50 (1920 x 1080)
- 1080i59.94 (1920 x 1080)
- 720p59.94 (1280 x 720)
- 1080p30 (1920 x 1080)

Audio Configuration



Algorithm

- **Algorithm**

  Select the audio algorithm: G.711 or AAC.

  G.711 and AAC from client to server direction are supported. Thus, bidirectional audio communication is supported.

- **Bit rate**

  Select the bitrate between 64Kbps and 128kbps when AAC is selected.

  The sampling rate is fixed to 8KHz and 32KHz for G.711 and AAC respectively.

  Note! *When two MCC units are connected together (encoder - decoder) the audio settings should be identical.*

Mode

- Select audio operation mode:

Mode	Action
Off	No operation
Tx - Only	Transmit only
Rx - Only	Receive only
Tx & Rx	Transmit and Receive

Input Gain

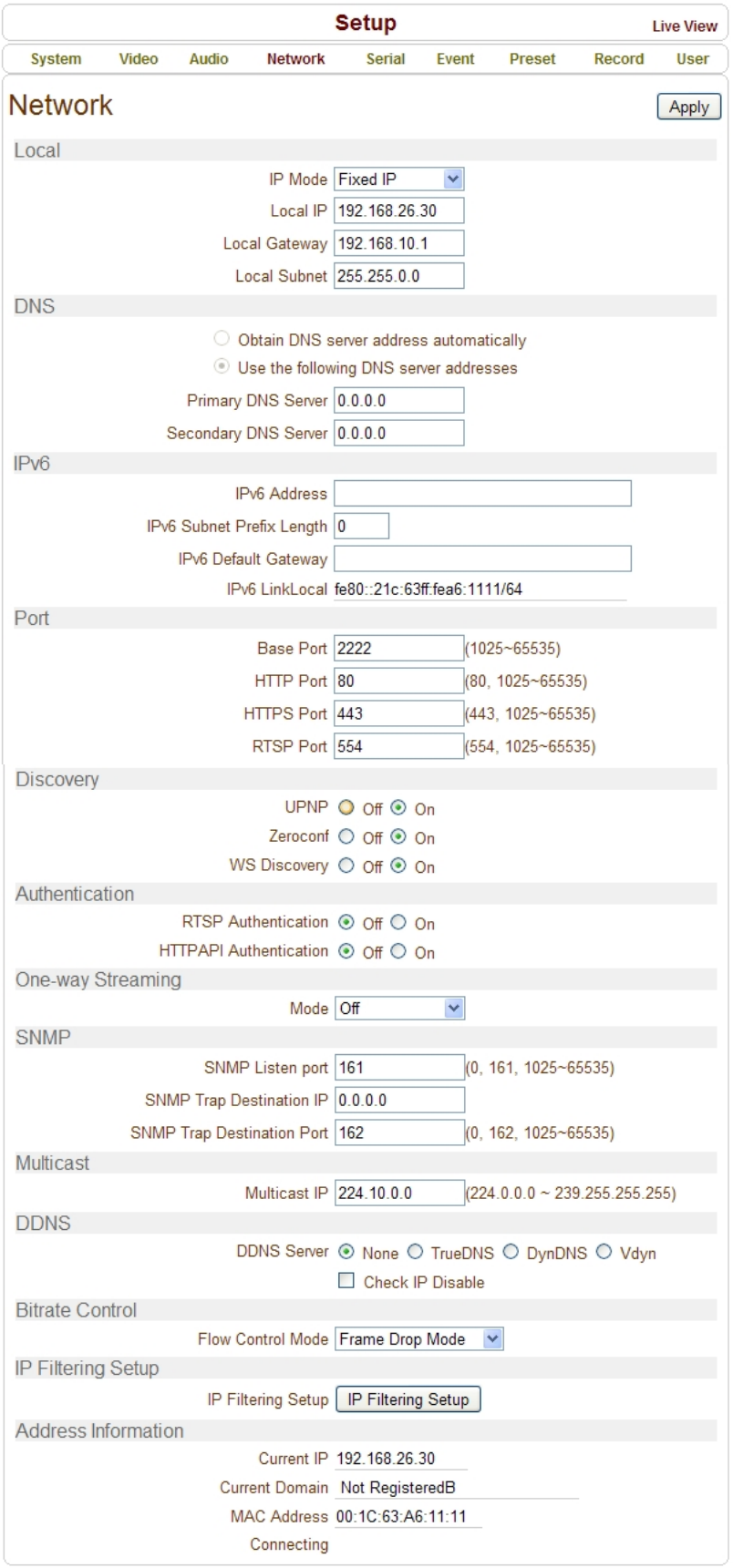
- Set audio input gain from 0 to 31.

Audio Output

Configure the audio source to be played on audio output port.

- Decoded Audio: Audio stream from client is played.
- Loopback: Audio data from audio input port is loop-backed to the audio output port.

Network Configuration



Local

- **IP mode**

  Select the IP mode: Fixed IP or DHCP (Dynamic Host Configuration Protocol).

  Depending on the selected mode, further configuration items come as follows:

IP Mode	Selection	Description
Fixed IP	Local IP	Fixed IP address
	Local Gateway	Gateway IP address
	Local Subnet	Subnet mask
DHCP	N/A	

DNS

- **Obtain DNS server address automatically**

  Get DNS server address automatically when IP mode is DHCP.

- **Use the following DNS server addresses**

  Enter the DNS server IP address manually.

- Primary DNS server
- Secondary DNS server

Ipv6

- **Ipv6 Address**

  Enter the designated Ipv6 address.

- **Ipv6 Subnet Prefix Length**

  Enter the bit number of Ipv6 Subnet.

- **Ipv6 Default Gateway**

  Enter the designated Ipv6 gateway.

- **Ipv6 Link Local**

  Display Ipv6 Link Local.

Port

- **Base Port (1025 ~ 65535)**

  Enter the Base Port number.

  Network base port is use for communication with remote clients. In order for camera and remote systems (decoder or VMS, NVR software) to be connected, the port number must be identically configured in camera side and client side.

- **HTTP Port (80, 1025 ~ 65535)**

  Enter HTTP port used for web-based connection.

- **HTTPS Port (443, 1025 ~ 65535)**

  Enter HTTPS port used for secured HTTP connection.

- **RTSP Port (554, 1025 ~ 65535)**

  Enter RTSP port used for RTSP-based connection. The default RTSP port is 554.

  RTSP (Real Time Streaming Protocol) is a standard for media streaming between server and client.

Discovery

- **UPNP**

  By setting **UPNP** to ON, it allows the discovery by the client according to UPNP (Universal Plug and Play) protocol.

- **Zeroconf**

  By setting **Zeroconf** to ON, it allows the discovery by the client according to Zeroconf protocol.

- **WS Discovery**

  Discovery function based on web service is enabled. It allows the discovery by Client SW which is supporting Onvif.

Authentication

- **RTSP Authentication**

  If **RTSP Authentication** set to **ON**, user in the client side is asked to enter User ID and Password.

- **HTTP API Authentication**

  When **HTTP API authentication** set to **ON**, HTTP Authentication is asked for all clients

  which use HTTP API.

One-way Streaming

- This encoder provides two kinds of one-way (unidirectional) streaming based on UDP to clients: **RTP** and **MPEG-TS**. Both are a kind of broadcasting where traffic from client to server is not generated at all.

- **RTP (Real-Time Transport Protocol)** is an Internet protocol used for transmitting single real-time multimedia data such as audio and video to a select group of connected clients. Normally RTSP uses RTP to format packets of multimedia content. **RTP** menu is used when the RTP only streaming without RTSP connection. RTP stream will be transmitted to the destination set. The SDP (Session Description Protocol) file can be found in the server, and a client can retrieve it using http connection.

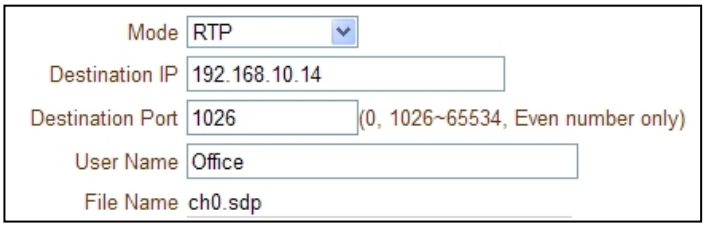
  Related settings are as follows:

- **Destination IP**: Set the IP Address of the destination system which will receive RTP stream.

  If the system is decoder, RTSP authentication information can be entered in the middle of RTSP URL as follows:

  rtsp://**admin:1234**@192.168.10.100:554/video1

- **Destination Port**: Set the Port of the destination system which will receive RTP stream.
- **User Name**: Enter the User name that will be used as session name in the SDP file.
- **File Name**: Enter the file name that will be used as the name of the SDP file.
  Then, it can be accessed through http://ServerAddress/filename

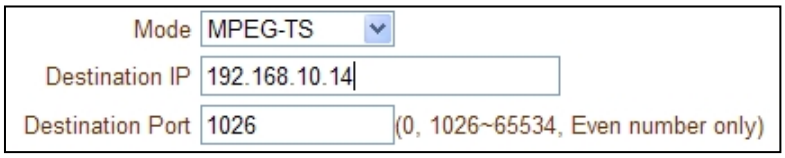


- **MPEG-TS** is a standard format for transmission and storage of audio, video, and data, [7] and is used in broadcast systems such as DVB and ATSC. Transport Stream is specified in MPEG-2 Part 1, Systems (formally known as ISO/IEC standard 13818-1 or ITU-T Rec. H.222.0). Transport stream specifies a container format encapsulating packetized elementary streams, with error correction and stream synchronization features for maintaining transmission integrity when the signal is degraded.

  As MPEG-TS itself supports only AAC as the audio algorithm, only video is streamed when audio algorithm is set to G.711.

Related settings are as follows:

- **Destination IP**: Set the IP Address of the destination system which will receive MPEG-TS stream.
- **Destination Port**: Set the Port of the destination system which will receive MPEG-TS stream.



SNMP

Setup for using SNMP (Simple Network Management Protocol). It is compatible to both SNMPv1 and SNMPvec. Settings for using SNMP (Simple Network Management Protocol) are as following:

- **SNMP Listen Port (0, 161, 1025 ~ 65535):** The port is for connecting external devices when system operates as a SNMP client. SNMP is not used by setting 0 value.
- **SNMP Trap Destination IP**: Set the SNMP Trap Destination IP.
- **SNMP Trap Destination Port (0, 162, 1025 ~ 65535):** Set the SNMP Trap Destination Port. SNMP is not used by setting 0 value.

Multicast

- **Multicast IP**

  The Multicast menu is used for configuring the multicast IP address to which media stream is delivered when a client such as a Decoder, VMS or NVR software is connected in multicast mode. The multicast IP address selection range is between 224.0.0.0 and 239.255.255.255. The selection can be used only when media protocol is set to Multicast.

DDNS

Recommended setting is none.

- **Check IP Disable:** If “Check IP Disable” is selected, it will skip to check its own IP. In Fixed IP mode, the set IP will be registered on DDNS server. In DHCP mode, dynamically assigned IP will be registered on DDNS server. Normally **Check IP Disable** should be unchecked in order to obtain public IP in the network.

Bitrate control

When there are more than one client connected to the camera, due to bandwidth difference among the clients some of them do not have enough bandwidth to receive encoded stream completely. In this case, it is possible to select the way to stream video to clients as following.

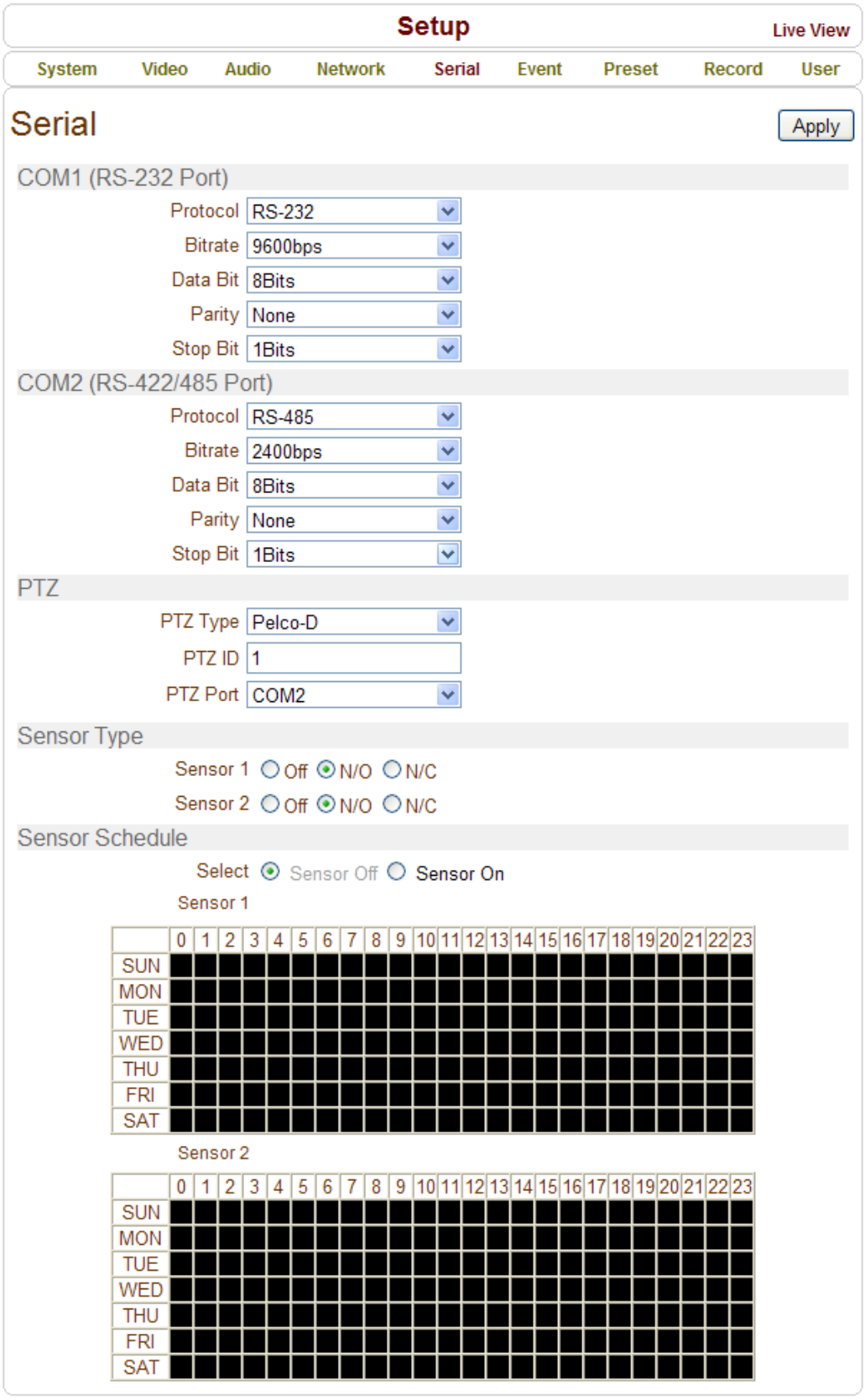
- **Frame Drop Mode:** Encoding is performed strictly according to video settings. When a client is connected through a network with less bandwidth, it may not receive all the frames. That is, frames are dropped on sending module if the network is bottlenecked.
- **Suppression Mode:** Encoding bitrate and frame rate are adjusted not to drop any frames when the network bandwidths to some clients are limited. In this case, all clients can be affected by the averaged bitrate and frame rate.

Address Information

Followed network information is displayed (Read only).

- **IP Address:** The IP address for the video server (either defined fixed address or address assigned by the DHCP).
- **Domain Name:** In case the video server is registered at DDNS server, the registered domain name is displayed.
- **MAC Address:** Display the MAC address of the video server. In case the video server is registered at DDNS server, the MAC address is used in DDNS registration.
- **Connecting:** Client IP Addresses that are currently connected to system are listed.

Serial Configuration



Serial Port Configuration

- **Serial Protocol:** Two COM ports are available at MCC201 and MCC201H; RS-232 and RS-422/485.
  See more information in appendix 6 (e.g. wiring details).

- **Serial Port Configuration:** The serial ports can be configured as follows.

Note! Each of the serial ports configurations must be same as the connecting device.

Mode	Selection
Bitrate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data Bits	5, 6, 7, 8 bits
Parity	NONE, EVEN, ODD bit
Stop Bit	1, 2 bit

PTZ

- **PTZ Type:** Select the type of PTZ camera or receiver.

- **PTZ ID:** Since it is possible to control multiple PTZ cameras or receivers over single control line, each camera or receiver will be assigned with unique ID. Enter PTZ ID of a camera or receiver for control. The ID value range can be between 0 and 255.

- **PTZ Port:** Select the serial port used for PTZ camera control.

Sensor Type

There are two sensor input ports on MCC201. Each of the sensor ports can be configured to the following.

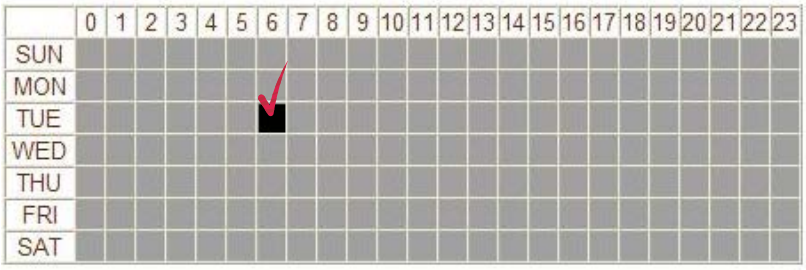
Function	Operation
OFF	Not used.
NO (Normally Open)	The port is normally open and activated when closed.
NC (Normally Closed)	The port is normally closed and activated when opened.

The function of the sensor port is set based on the type of the sensor connected.

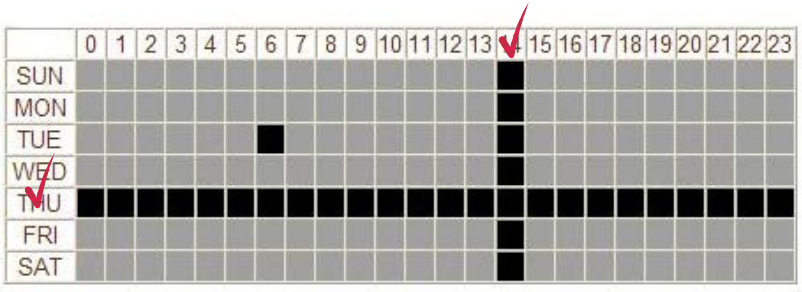
Sensor Schedule

- Choose **Sensor OFF** or **Sensor ON** and click the below schedule cells to make Sensor Schedule according to day of week and hour.

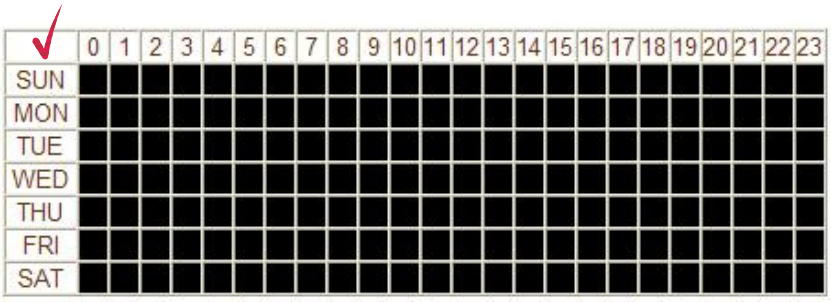
- Click desired "**Cell**" to set schedule.



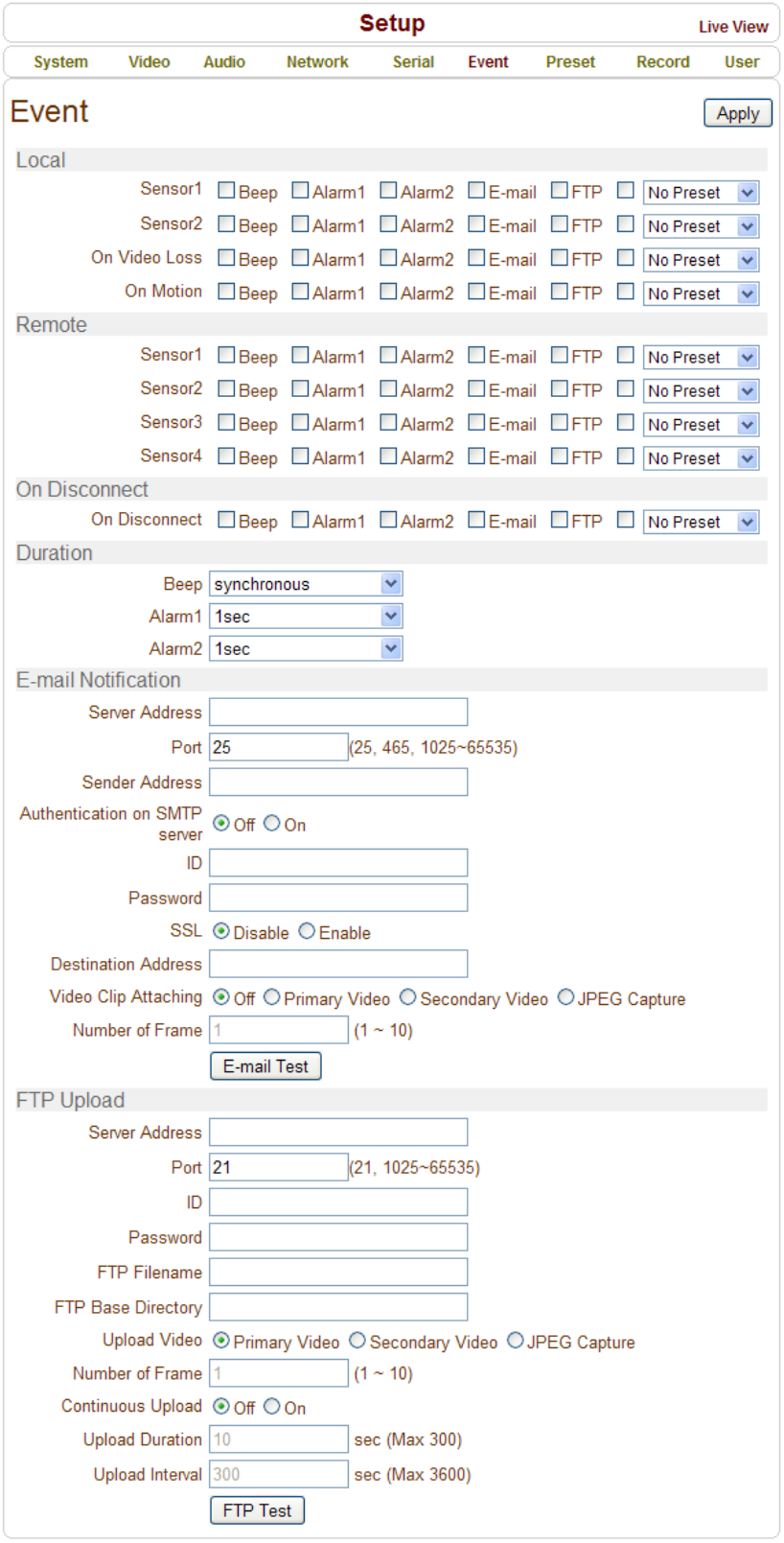
- Click desired "**Time Line or Date Line**" to set schedule.



- To set cells in the schedule, click below "**Empty Cell**".



Event Configuration



This product has two sensor ports and two alarm ports.

When a decoder instead of a PC client is connected to encoder, one system becomes a Local system and the other as a Remote system (in general a system which is being used by the user is called as Local system). Then, actions for events can be configured for events from the remote system as well as for local system. For example, it is possible to turn on an alarm device in local (center) decoder system when a sensor device in remote end (site) encoder is triggered. **Local** section configures the actions for events from local (self) system, and configuration activates local devices and **Remote** sections configure the actions for events from remote (peer) system.

The following table lists the possible actions for events.

Action	Description
Beep	Triggers beep port.
Alarm out	Triggers alarm (relay) port.
E-mail	Sends E-mail to the specified address. AVI file can be attached.
FTP	Upload AVI file to a specified FTP server.
Preset	Move to the Preset position.

Local & Remote Event Configuration

- **Sensor1 / Sensor2**

  Configure the actions when the sensor is activated. Multiple actions can be set for a single event.

- **On Video Loss**

  Configure the actions when video input signal is lost. Multiple actions can be set for a single event.

- **On Motion**

  Configure the actions when motion is detected. Multiple actions can be set for a single event.

- **On Disconnect**

  Configure the actions when the link (connection) with peer system is disconnected. Multiple actions can be set for a single event. This event happens when the last client which has been receiving video from the camera loses the connection.

Alarm and Beep activation duration

- Set the duration of alarm or beep activation in case of an event. If it is set to **continuous**, it will be in active state until the operator resets it manually.

E-mail Notification

- Specify the information to send event information, when E-mail is selected as an event action.

- **Server Address:** Enter an address of mail (SMTP) server.
- **Port:** Specify a port for SMTP operation (**Port 25 is the default port in SMTP operation**. If a different port is configured in the SMTP server, this port needs to be changed accordingly).
- **Sender Address:** Enter an account registered in the SMTP server.
- **Authentication on SMTP server:** Specify if the E-mail server requires authentication for E-mail sending.
- **ID & password:** When the server requires authentication, ID and Password of an E-mail account need to be entered.
- **Destination address:** Enter Destination address. More than one address can be entered by delimiting comma (,) or semi-colon (;). Destination address can take up to 63 characters.
- **Video Clip Attaching:** Video clip stored at the moment of event can be attached as an AVI or JPEG file format. When dual encoding is enabled, **Primary video**, **Secondary video** (H.264 only) or **JPEG Capture** can be selected. The duration of video clip can be configured with **Pre-Event Time** and **Post-Event Time** in **Event Record** section.
- **Number of Frame:** The number of JPEG frames is configured. This setting is applicable only when **JPEG Capture** is selected.
- **E-mail Test:** E-mail sending can be tested with this button. Please note that configured settings should be saved first by pressing **Apply** button before using E-mail Test function. One of the following messages will come as a result of the test.

Message	Description
E-mail sent successfully	Test E-mail has been sent successfully. Reception in the client can be checked.
Failed to connect SMTP server	Connection to the SMTP server failed. It is necessary to check if the server is reachable and server address and port are correct.
Authentication failed	The server is reachable but authentication failed. ID and/or password need to be checked.
SMTP server rejected the mail	The server is reachable, but mail sending failed due to a reason other than authentication. This error happens often when the server authenticates according to its own rule. For example, IP addresses of a specific range or addressed of a specific suffix are allowed.

FTP Upload

Specify the information to upload event information, when FTP is selected as an event action.

- **Server Address:** Enter an address of an FTP server to receive video files.

- **Port:** Specify a port for FTP operation (Port 21 is the default port in FTP operation. If a different port is configured in the FTP server, this port needs to be changed accordingly).

- **ID & password:** Enter ID and Password for accessing the FTP server.

- **FTP File name:** The names of files upload by FTP can be specified by user. If a fixed name is specified, the file is overwritten repeatedly.

  Max length of a file name is 60 characters. If the name is left blank, file name is determined according to the internal rule implemented in the firmware.

  The following macros are supported to form variable parts of file names. The strings are case-sensitive.

  %YYYY : year
  %MM : month
  %DD : day
  %hh : hour
  %mm : minute
  %ss : second
  %EVENT : event type (Sensor1, Motion, ...)
  %ADDR : address of the server (Domain name when DDNS is used.
  Otherwise IPaddress)

  ".avi" or **".jpg"** will be added automatically at the end of the filename depending on the type of video file.

- **FTP Base Directory:** Specify the name of the directory to be created in the FTP server. It is valid only when **Use Record** is set to **Use FTP on Record session**.

- **Upload video: Primary Video** and **Secondary Video** (H.264 only), **JPEG Capture** can be selected for uploading. The duration of video clip can be configured with **Pre-Event Time** and **Post-Event Time** in **Event Record** section.

- **Number of Frame**: Enter frame number of JPEG Capture (from 1 to 10).

- **Continuous Upload:** Continuous upload '**On'** allows video clips to be transmitted regularly regardless of occurrence of events. When this mode is turned on, FTP upload by events is suppressed.

- **Upload Duration**: Specify recording duration of a video clip to be transmitted. (Max 300 sec).

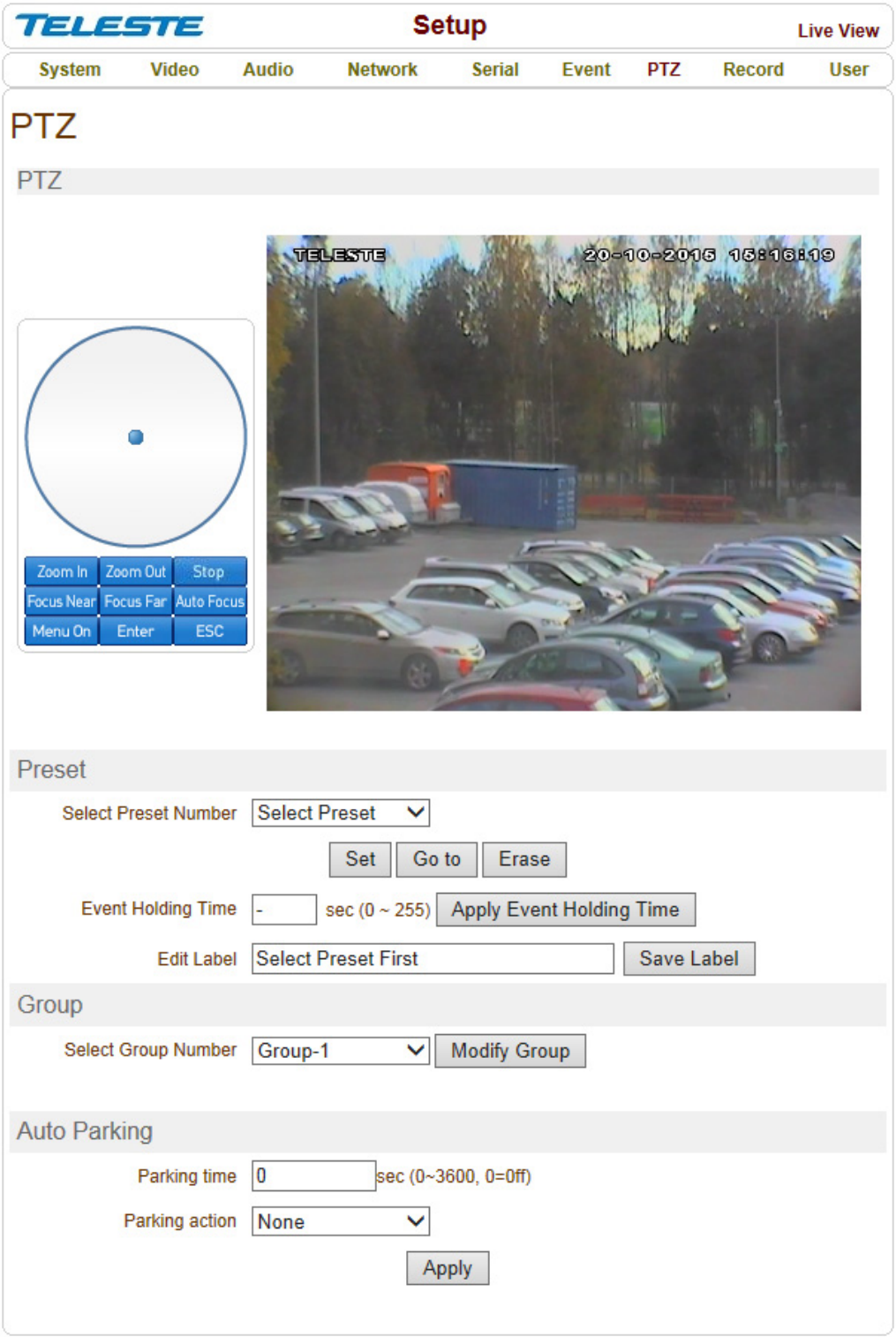
- **Upload Interval**: Specify transmission interval. (Max 3600 sec).

  Upload Duration is not included in Upload interval. For example, if Upload Interval is 60 seconds and Upload Duration is 20 seconds, a video clip for 20 seconds is transmitted every 80 seconds.

- **FTP Test**: FTP upload function can be tested with this button. Please note that configured settings should be saved first by pressing **Apply** button before using FTP Test function. One of the following messages will come as a result of the test.

Message	Description
FTP connection tested successfully	The connection to the FTP server is successful.
Failed to connect FTP server	The connection to the FTP server failed. It is necessary to check if the server is reachable and server address and port are correct.
Authentication failed	The server is reachable but authentication failed. ID and/or password need to be checked.
Failed to upload file	File upload failed. The user of the ID is not allowed for writing into the directory or FTP server can be full.
Failed to erase file	Failed to delete the test file. The user of the ID doesn't have the privilege for file deletion.

PTZ

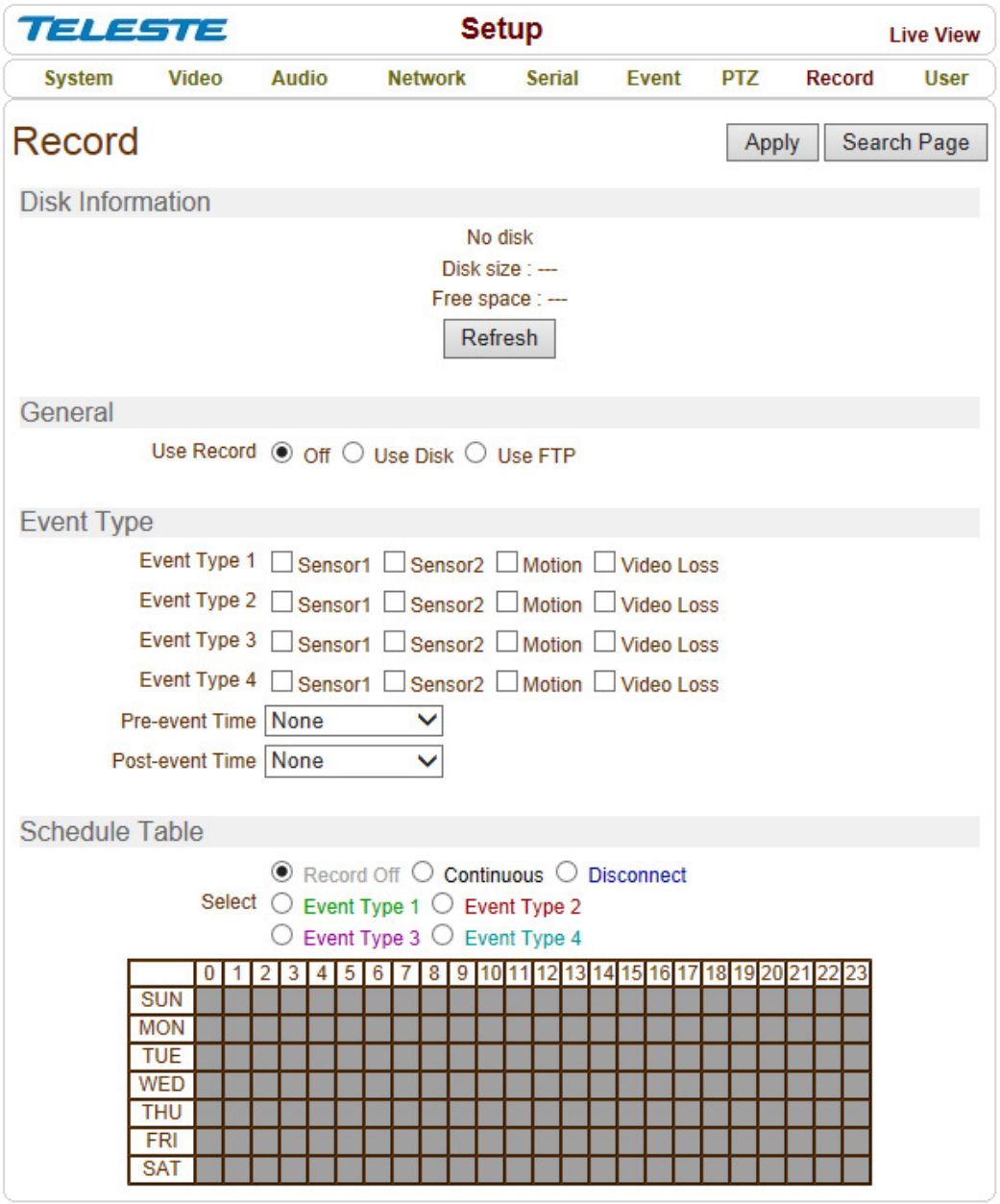


Preset

- Select preset # and insert the name of preset.

- Set camera position for the preset and press **Save Label** button.

Record Configuration



DISK

SD memory can be used, and at least 1GB size is recommended. Either EXT3 or FAT32 file system can be used. A disk with either EXT3 or FAT32 file system can be read in Linux PC. However, only disk with FAT32 file system can be read in Windows PC.

Less than 4Mbps of video bit rate is recommended when you record and monitor video simultaneously since frame dropping may happen due to performance limitation.

Disk information

Be sure to restart the system after connecting an SD card. During booting, the system reads status of disk and initializes it. Once the initialization of a disk is finished, the status of disk is shown on **Record** page of web-based setup.

Refer to the chart for checking the status of disk.

Disk status	Description
Disk error detected	Error.
No disk	Disk is not connected to the system.
Searching Disk information	Checking the status of disk. Refresh the page and wait until the status is changed.
Mounting and Recovering Disk...	Performing recovery process when disk damage is found. It takes from seconds to minutes for recovering.
Disk format needed	Disk is attached, but the type of the file system is unknown or damaged.
Unknown disk type detected	
USB Disk available	Available to be used for recording.
Disk removed or in abnormal state	Disk is detached during operation or there is damage on the file system. If it happens while disk is connected, it is recommended to format the disk.

General

- **Use record**

- **Off**: Recording function will not be used when **"Off"** is selected.
- **Use Disk**: Recording will be enabled and data will be written to a disk.
- **Use FTP**: Recording will be enabled and data will be uploaded to an FTP server.
  In this mode FTP upload by event is automatically disabled.

Event Type

Three recording modes are supported: **Continuous**, **Event**, **Disconnect**. In case of Event recording, event types can be selected among several events. Selected event type is used for configuring the schedule table. Up to 4 event types can be configured and each event type can be a combination of sensor, video loss and motion event.

- **Pre-event Time**
  Specify the duration of recording before an event happens.

- **Post-event Time**
  Specify the duration after the event is cleared.

Schedule Table

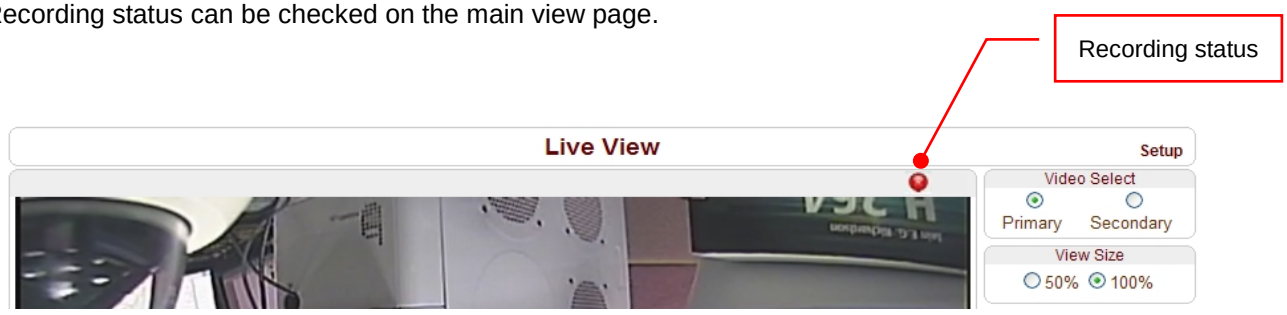
Actual recording mode is determined by **Schedule Table**, where recording mode configured by day (of a week) and hour.

Each of recording mode configures the recording operation as follows:

- **Record off**: No recording.
- **Continuous**: Records continuously.
- **Disconnect**: Recording is started when the system loses the connection to its last client (Decoder, VMS/NVR) etc. When there are multiple clients and one of the client is disconnected, this doesn't happen.
- **Event Type**: Records when an event configured in **Event Type** setting happens.

Checking status of recording

Recording status can be checked on the main view page.



Search and Playback

Recorded video and audio data can be saved as **AVI format** in the disk. In general, one AVI file is created for an event in case of event-based recording. However, it is possible that recorded data by serious of events happening continuously can be merged to a single AVI file depending on pre/post event time setting. The size of file is limited to 10 ~ 200MB or 10 minutes. In case of continuous recording, AVI files are created in series and the size of each is limited to 10 ~ 200MB or 10 minutes.

- **Search**

  Actual recording a file currently being recorded doesn't appear until it is completed.

  In case of Continuous recording, a file will be shown after 10 minutes from the start of recording, for a file is generated every 10 minutes.

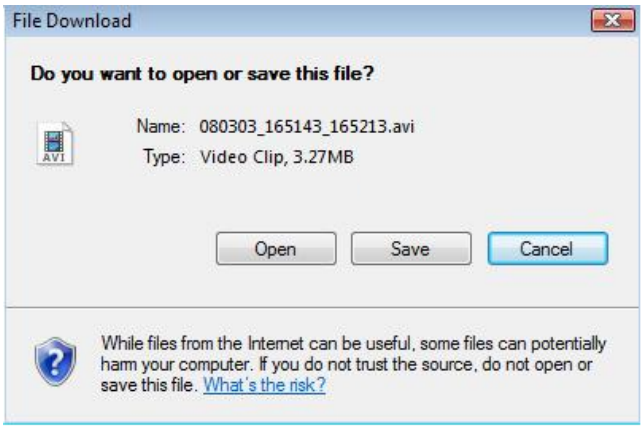
1. Press **Search Page** button on the **Record** setup page. Dates with recording data will be shown as follows.

2. First, choose the date for search and the list of AVI files will be shown.
3. The file name shows the date and time: "**Date Begin Time End Time.avi**".

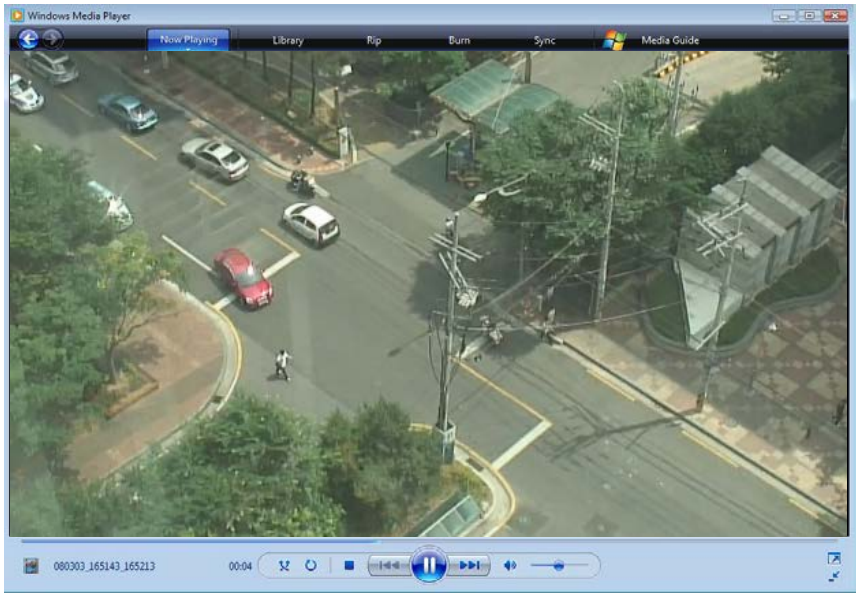
4. Press **Root** to move back to the page with date list.

- **Playback**

1. Selecting an AVI file will show a dialog for opening or saving the file.


File Download
Do you want to open or save this file?
Name: 080303_165143_165213.avi
Type: Video Clip, 3.27MB
Open
Save
Cancel
While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

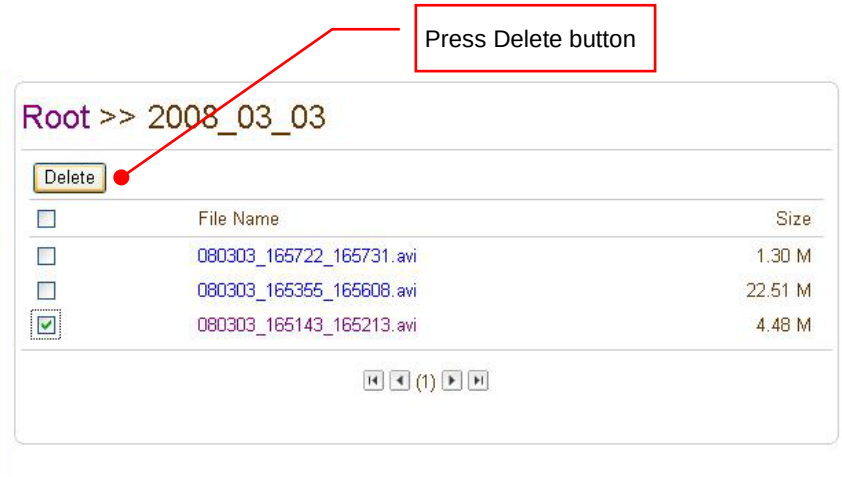
2. Pressing **Save** button, the file will be stored in the PC. The AVI file can be played with Windows Media Player.



3. If you press **Open** in the dialog, the file will be downloaded and played automatically with Media Player.
4. Another connection through web is disabled during downloading and it is also not allowed to download two AVI files at the same time.

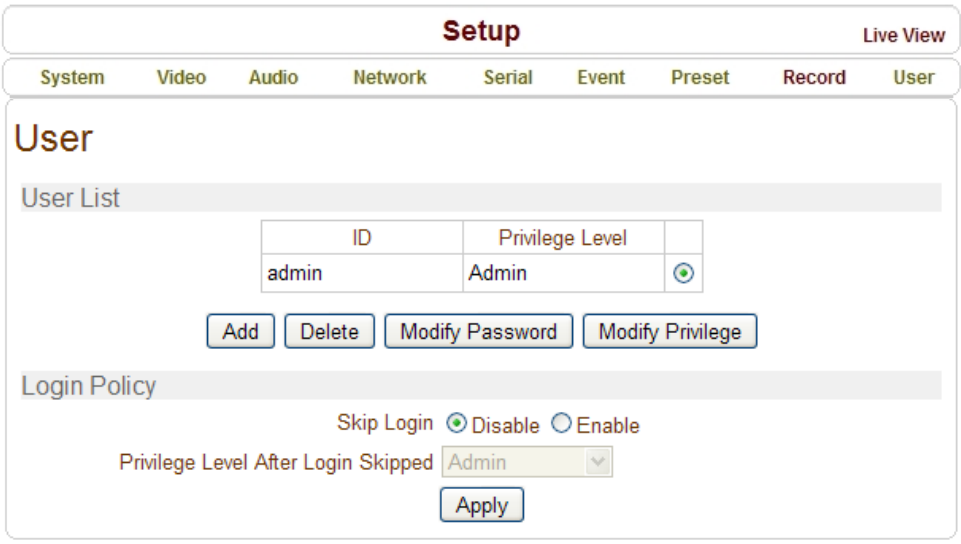
- **Deletion of data**

1. If you want to delete recorded files, select the files by checking the item in front of each file and press **Delete** button.



2. It is possible to delete multiple files at once.

User Configuration



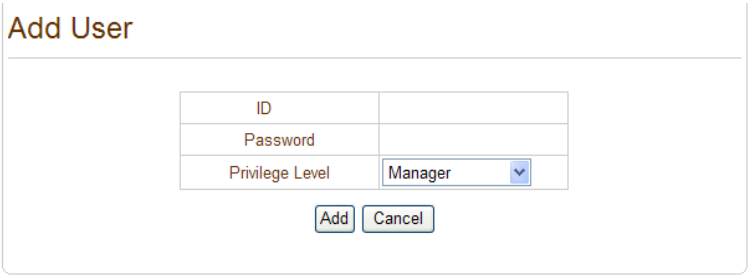
User List

- User can be registered and privilege level of a user can be specified. User configuration is allowed only to admin user. Max 16 users can be registered and each user can have one of four privileges.

Privilege	Allowed Operations	Remarks
Admin	All operations	User ID = admin
Manager	All operations except for user configuration	
User	Live viewing and PTZ control	
Guest	Live viewing only	

- **Add User**

  Press **Add** button. The following window will appear.



Enter User ID and password (Up to 15 characters) and select **Privilege Level.**

- **Delete User**

  Select the User to be deleted and press **Delete** button.

- **Change Password**

  Press **Modify Password** button. The following window will appear.

  Enter the current password and then set a new password.

- **Modify Privilege Level**

  Press **Modify Privilege** button to change User level. It is not allowed to change the privilege level of admin user.

Login Policy

- **Authentication Type**

  HTTP authentication based on RFC 2617 (HTTP Authentication: Basic and Digest Access Authentication) is supported.

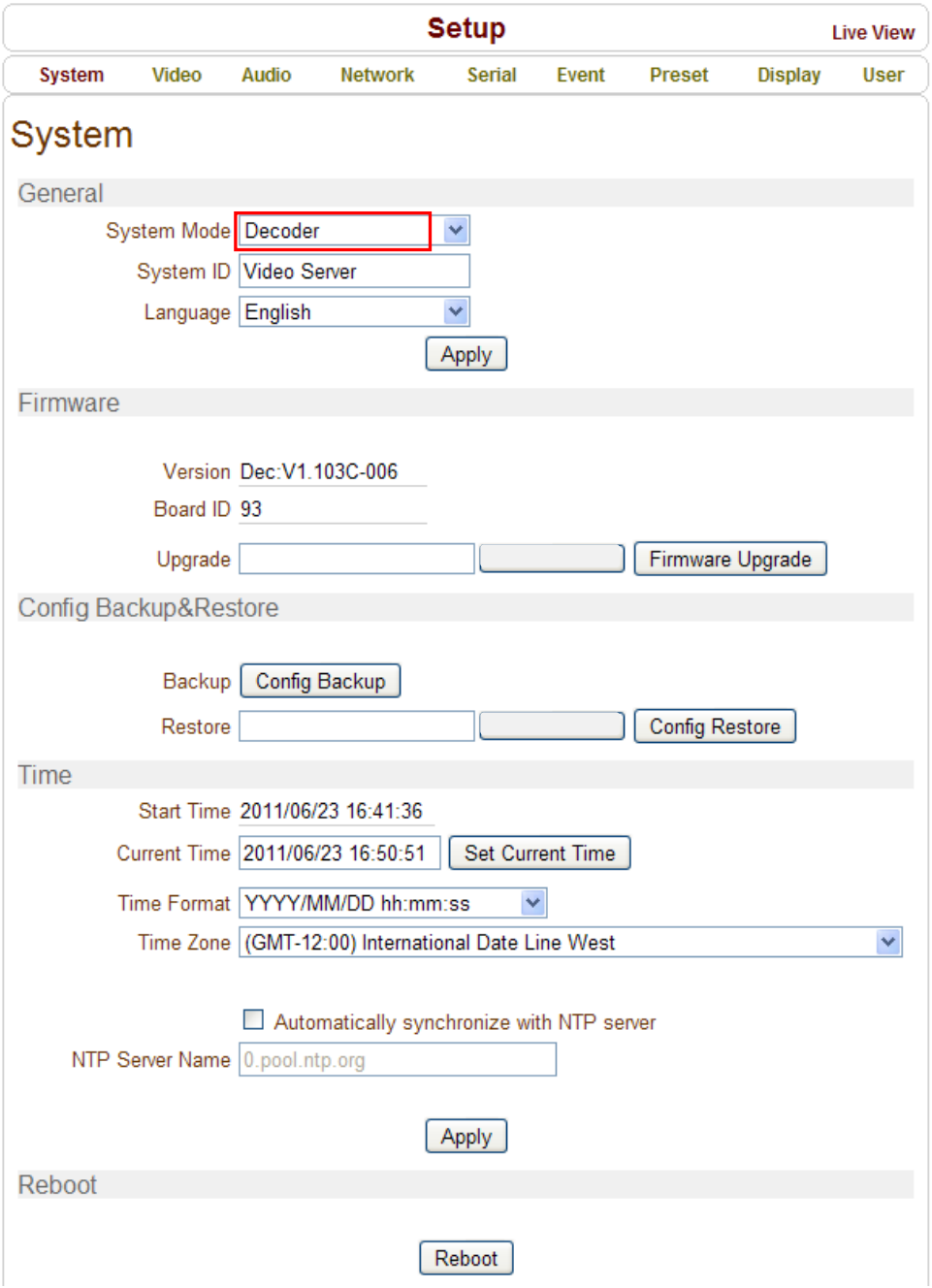
- **Skip Login** provides for convenient access to the server when authentication is not required. When Skip Login is set to **Enable**, login step is skipped. The privilege level after login in this way is determined by the setting of **Privilege Level after Login Skipped**.

5. Decoder Configuration

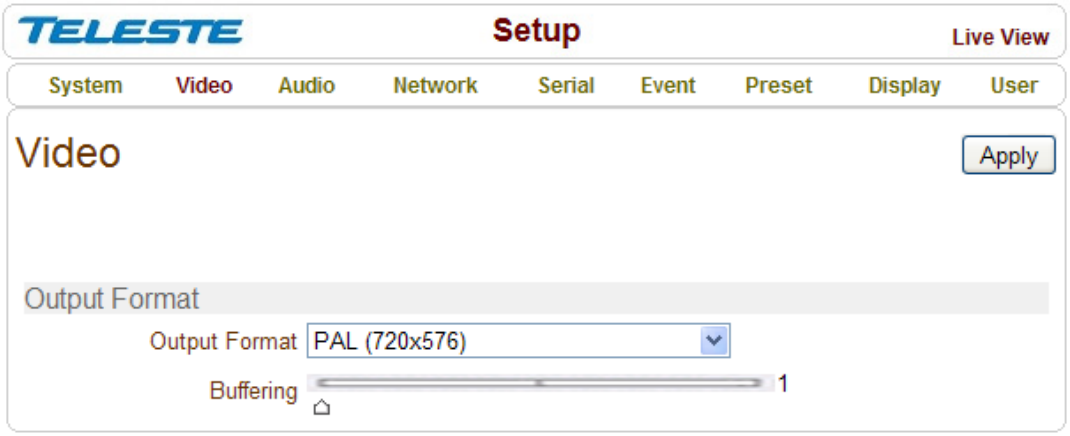
The unit can be also configured to a decoder operation. On the following pages are presented some major differences on the configuration settings compared to encoder operation.

Note! *When turning the operation from an encoder to a decoder requires a selection of the system mode and reboot of the device. Once the Apply button is pressed a windows dialogue will appear to confirm the restart.*

System Configuration

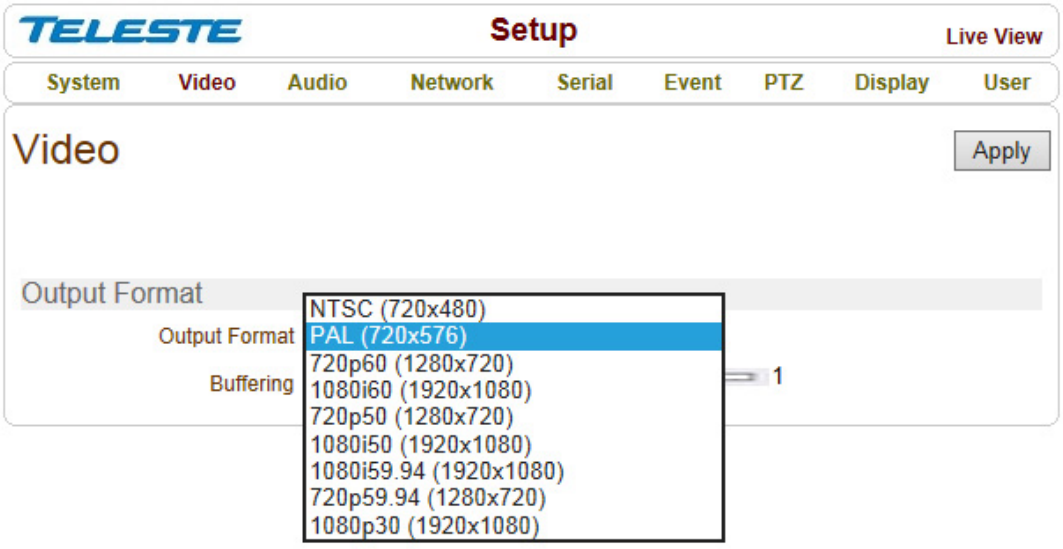


Video Configuration



Output Format

When MCC is used as a decoder, only the basic video resolution formats are supported on the device outputs. The list of formats is shown below.

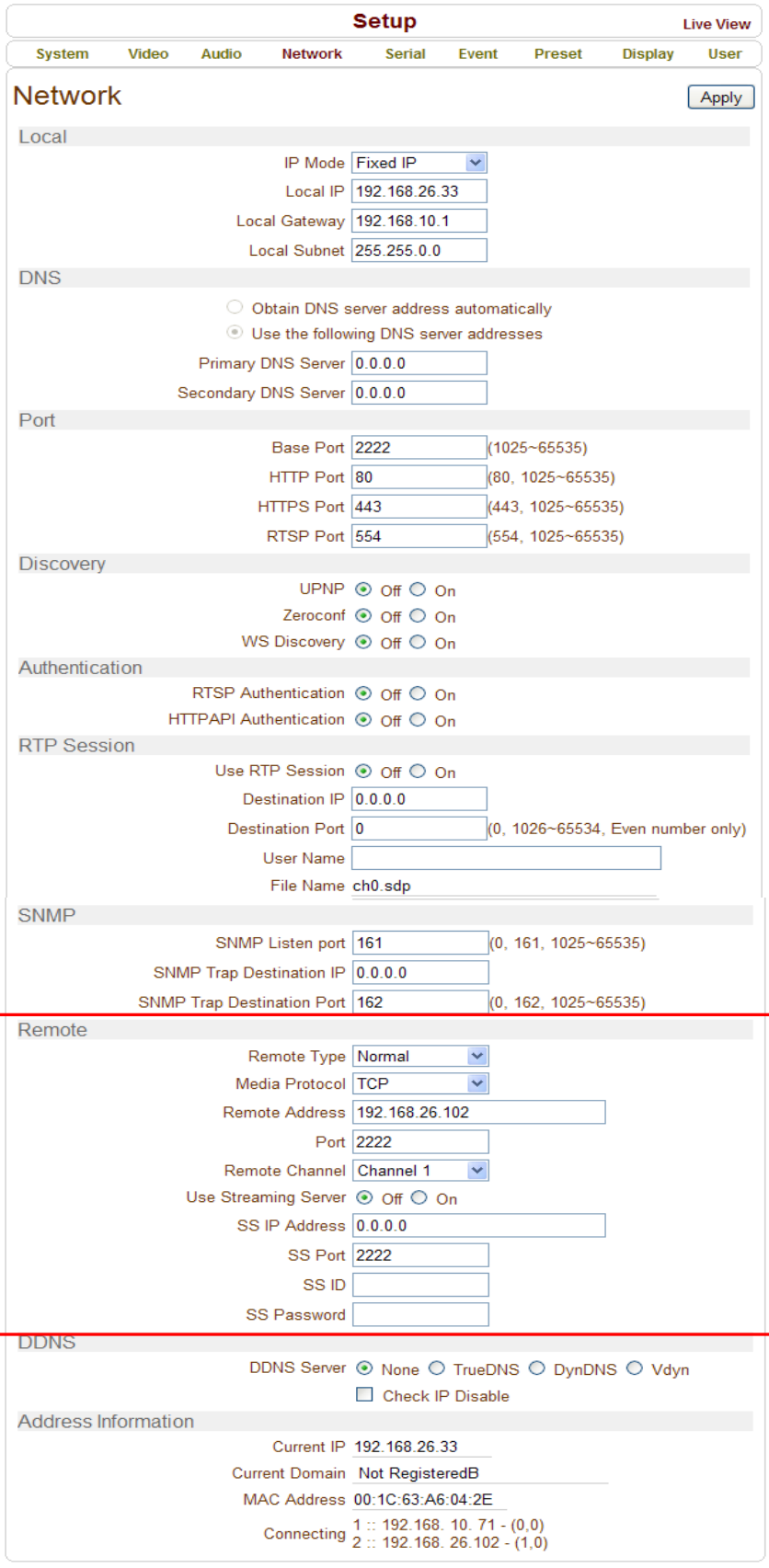


- **Buffering**

  You can store maximum 30 decoded frames temporarily by using buffering before displaying the frames. Displaying stored frames is smoother than displaying in real time. However, displaying stored frames causes delay because of process of buffering.

Network Configuration

Network configuration page has a section for specifying the remote system to be connected to (MCC encoder or IP camera).



- **Remote Type**

- Normal: Connection for Encoder and decoder.
- RTSP/RTP: Decoder system can make connection though RTSP protocol and get the stream via RTP. It is also possible to make connection with other vendor's H.264 IP camera supporting standard RTSP/RTP and standard H.264 algorithm.
- To make RTSP connection, set *Remote Type* to "RTSP", enter the RTSP URL of remote system to *Remote Address,* and RTSP access port number to *Remote Port*. Currently it supports only video.

- **Media Protocol**

Select protocol used for transmission of audio and video data between remote system and decoder. The decoder system or VMS can choose media protocol among TCP, UDP and Multicast.

- **Remote Address**

Address of the remote system to connect.

- **Port**

Port of the remote system to connect.

- **Remote Channel**

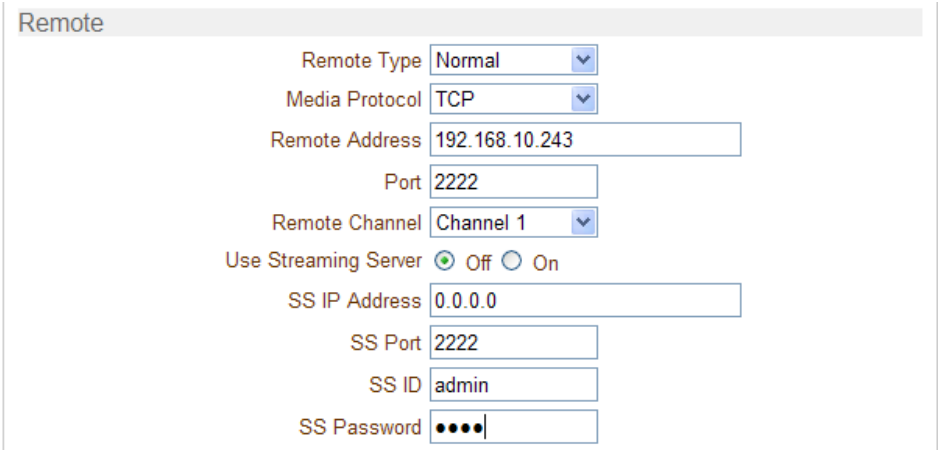
The channel can be selectable when the remote system has more than multiple video channels.

- **Use Streaming Server**

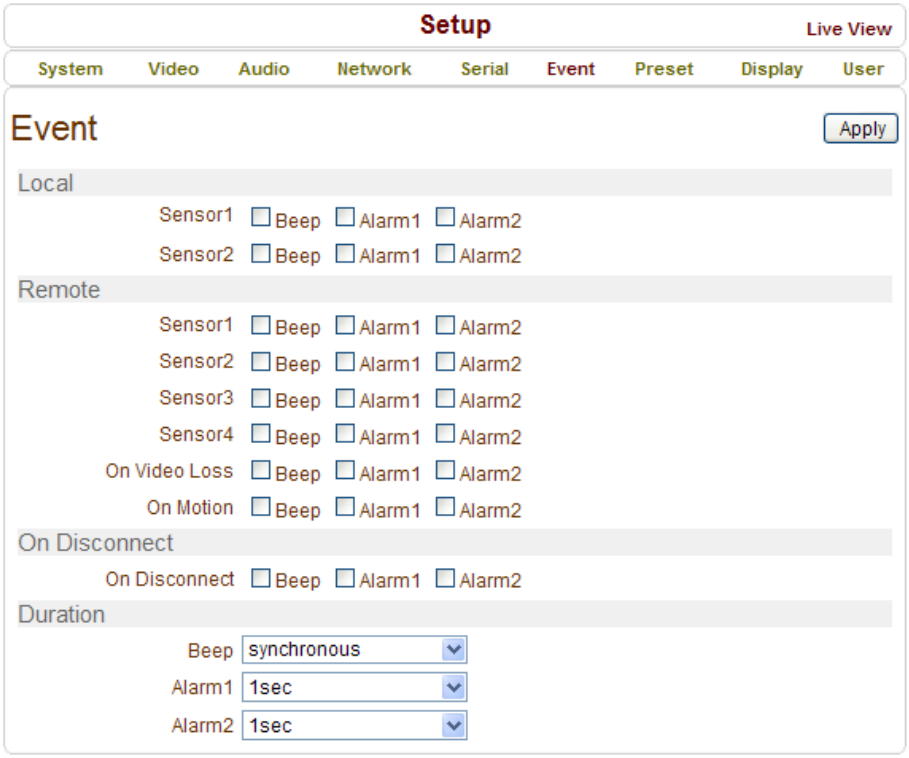
- Decoder system has the settings to connect to Encoder or IP Camera via the Streaming Server.

To connect to Encoder or IP Camera via Streaming Server, **Use Streaming Server** of **Remote** group in **Network** page should be set to **On** and information of the **Streaming Server (SS)** needs to be configured appropriately.

- **SS IP address:** IP address of Streaming server.
- **SS port:** Enter Port number that is set when registering Streaming server.
- **SS ID:** Enter Streaming Server ID.
- **SS password:** Enter Streaming Server Password.



Event Configuration



The event configuration configures the actions for each event type. **Local** section configures the actions for events from local (self = Decoder) system, and configuration activates local devices and **Remote** sections configures the actions for events from remote (Encoder or IP Camera) system.

The following table lists the possible actions for events:

Action	Description
Beep	Outputs beep sound using the buzzer in the system.
Alarm1/Alarm2	Triggers alarm (relay) port.
E-mail	Sends E-mail to the specified address. AVI file can be attached.
FTP	Upload AVI file to a specified FTP server.
Preset	Moves the PTZ to associated preset position.

- **Sensor1 / Sensor2**

  Configure the actions when the sensor 1 or 2 is activated. Multiple actions can be set for a single event.

- **On Video Loss**

  Configure the actions when video input signal is lost. Multiple actions can be set for a single event.

- **On Motion**

  Configure the actions when motion is detected. Multiple actions can be set for a single event.

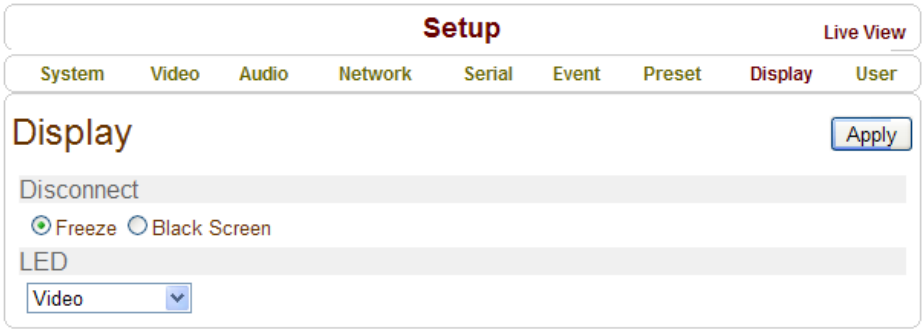
- **On Disconnect**

  Configure the actions when the link (connection) with peer system is disconnected. Multiple actions can be set for a single event.

- **Alarm and Beep activation duration**

  Set the duration of alarm or beep activation in case of an event. If it is set to continuous, it will be in active state until an operator reset it manually.

Display Configuration



- **Disconnection**

  Decoder system's output mode on disconnected state can be configured.

- Freeze: Video image of the last frame is shown when there is disconnection.
- Black Screen: Black Screen is shown when there is disconnection.

- **LED**

  Select from Video, Audio and Serial to be indicated by Data LED. When there is the selected data (Video or Audio or Serial) communication between the encoder and the decoder, Data LED will indicate the status.

6. Appendix

Appendix A: Sensor and Alarm Port

Sensor Port

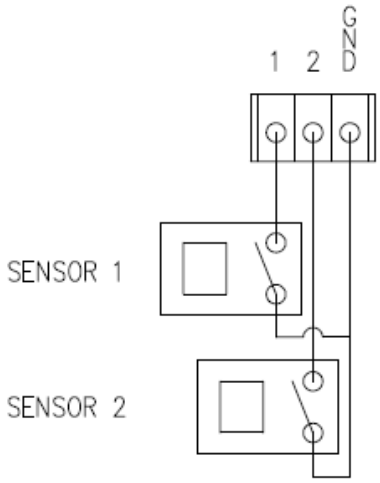
- **Terminal Type**

- Voltage Rating: 150VAC
- Current Rating: 2A
- Color: Red

- **Sensor Signal Input Type**

- NO Contact Signals

- **Connection to External Device**



Alarm Port

- **Terminal Type**

- Voltage Rating: 150VAC
- Current Rating: 2A

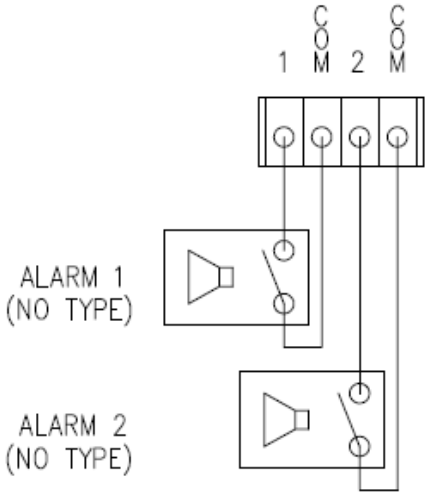
- **Relay Type**

- Contact Rating: 1A 30VDC
- Switching Power: Max 30W 62.5VA
- Switching Voltage: Max 60VDC

- **Alarm Signal Output Type**

- NO/NC Contact Signals

- **Connection to External Device**

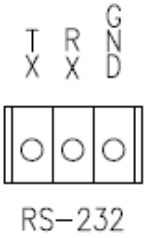


Appendix B: Serial Port

RS-232 Port

- **Port Type**

- 3 PIN
- Pin Arrangement



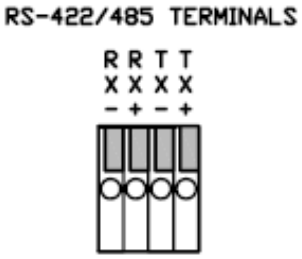
- Pin Description

Pin No.	Pin Name	Description
1	TX	RS232 TX(Transmit)
2	RX	RS232 RX(Receive)
3	GND	Ground

RS-422/485 Port

- **Port Type**

- 4 PIN
- Pin Diagram



- Pin Description

Pin No.	Pin Name	Description
1	RX-	RS422 RX-
2	RX+	RS422 RX+
3	TX-	RS422 TX- or RS485 TRX- (It is selectable by S/W Setup)
4	TX+	RS422 TX+ or RS485 TRX+ (It is selectable by S/W Setup)

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